Spatial Narrative in the Cinematographic Body Environment

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Abstract

Due to the experimental interface of cinematographic space fiction that produces temporal and spatial intervals, architectural design can be explored via time-body-space relationships. In this study, Eskihisar Coastline/Turkey has been selected as an urban coastline, due to its potential as a public space where the body can be observed, much like all public spaces. It is being examined with an experimental surface exploration developed with the relations between fragments of spatial intervals within the context of the movement-body experience in cinematographic spatial fiction. So cinematographic spatial fiction is a spatial narrative displayed based on the time-body-space fragments. The study has explored cinematographic fiction as an architectural design approach through the notions of time-body-space shared between the disciplines of cinema and architecture. The research methodology is qualitative; coherent to the case-study. The experimental phases consisted of the fragmentation of video recording, the multiple exposure experiment, and the "kinesphere" experiment phases that visualized the inter-surface connection codes of Eskihisar Coastline/Turkey as an urban coastline. Rudolf Laban's "kinesphere" approach, which questions the direction of bodily movement in relation to the limbs, is developed as a controllable, definable template for measuring the interval of body movement. This approach is handled the movement intervals over the proportions of the body as a measurable parameter through a geometric design approach. As a result, the surface articulations determined through the spatial intervals of experience produced urban furniture images. Cinematographic spatial fiction offers a geometry-based reading interval developed from the ratio-proportion of the body to the production intervals presented to the architectural design in the context of time-space through the produced urban furniture image. The interface designed in this study is expected to offer a solution proposal that can be developed from the body scale for the urban furniture needed in public spaces in the cities of the future.

782

INTRODUCTION
Spatial Body Relations in Everyday Urban Experience

"Ten Books on Architecture" (1998) written by Marcus Vitruvius Pollio in B.C. 25, emphasizes the importance of geometrical formation and connection, which overlap with the proportions and symmetry between the whole body and its limbs in the design of buildings. The interval of view drawn by Vitruvius in the context of spatial body relations for building and city design with the proportions of the human body also allowed Renaissance artists to lean on the body with an analytical approach and reconsider it in a geometric system (Sennett, 2008). It can be said that the spatial body relation in the Renaissance period, whose boundaries are drawn through idealized body scale, proportions, and symmetry, is reflected in the design of space as a proportional connection with this body is established. From the Renaissance to the 20th century, spatial body relations emerged according to the ways of thinking developed over the measurable characteristics of the body as the subject in spatial approaches. In the 20th century, the effects of the technological developments in the Modern Period and the changes in the production styles of the Industrial Revolution on the design of space and on the body as its user were also reflected in the spatial body relation. The impact of the concepts of standardization and mass production on the production of space as well as the Cartesian concepts of mechanization and functionality, which idealize, universalize, and attempt to objectify the body, is dominant. The sense of the period, which considers the body detached from its relation with its environment, reveals a digitized definition of the body, which is placed inside the digitized space depending on the production practice and then divided into parts with measurable features.

When the spatial body approaches developed from Vitruvius to the Modern Period are examined, one common element is that the body is a means of perceiving and designing the outside world. It is an object as the scale of space design, reduced to its measurable properties and is the user of the idealized space designed regarding its dimensions. The body is neither the subject nor the object that structures the space with the interaction it establishes with the environment with its perceptual and sensual features. Rather, it constructs a fluid and dynamic spatial body relation that is detached from all given possibilities of internal and external relations. The effect of this constant fluctuation on the design of space and the definition of space as a means of perceiving the outside world has also changed. In processes where the interaction with space is ignored, the approach based only on the measurable features of the body in space design also reduces the spatial body relation to a digitized system. Whereas the body shapes it by constantly interacting with the environment that creates it. The physical and mental experiences it produces in the space while on the move exist in the fluidity of time. The body interacts with the experienced space depending on time (Tanju, 2008). As a result of a temporal rupture, form corresponds to space

solidified by the freezing of time. By looking at the relation of space produced with body-space mobility and time, it may be possible to improve the scope of space by embodying time (Uysal & Arıdağ, 2012). Space as a perceived and lived being can be understood through temporal events. For this reason, architecture is reproduced based on space-time relations beyond a physical environment (Arıdağ et al., 2009). The expression of experience in terms of place or time is insufficient to explain its relational nature. Experience expresses in synchronicity involving forces or processes interacting with one other (Kwinter, 1998). These synchronicities are considered in the study as the orientations of the body on the route it follows in time. By focusing on sensual existence, interaction with the environment, and spatial experience in addition to its physical possibilities, spatial body relations have been transformed, revealing the spaces of experience. On the other hand, approaches developed through the body's experience of seeing develop a spatial body approach that reconstructs the body and space with different perspectives by questioning the given limits of the body. Spatial approaches, which take reference from the digitization of the measurable features of the body, evolve into an understanding of space and reveal both its physical and sensual characteristics and the relation it establishes with the environment it interacts with. Through that fluid and dynamic body understanding, both the fiction and interaction with the movement experience are produced and the spatial possibilities of the movement-body experience are increased.

782 At this point, Laban's Movement Analysis (Laban, 1960), which questions the relation of the body with space through movement, becomes significant. Rudolf von Laban (1879-1958), known as a philosopher, scientist, mathematician, dance theorist, as well as artist, architect, dancer, choreographer, dance designer, and painter, developed experimental approaches to movement theory. Laban's approach can also be linked to the discipline of architecture as it reveals the dynamics of movement-body, particularly through dance. Unlike previous dance notation systems, in which the dance moves of the body performed on stage are recorded, Laban's experimental exercises focus on the produced movements themselves. His analysis system is significant in terms of space approaches established with the body, as it provides the body with the flexibility to produce its choreography and opens it to interaction with dance, choreography, music, space, and other dancers. Questioning the relation of the body with the rules of dance, the stage, and the choreography, Laban argues that research on movement, the body that produces the experience can be seen through the elements it draws in his performance. In this direction, Laban questioned the limits of choreography, made movements revealed by the body more visible, and examined the relation between the dance space and the elements of movement produced by the body by questioning geometric solids. Laban says that in his approach, the traces left by the route the body draws on the stage during the performance define the dance space (Laban, 1975).

This approach carries the dance space from the stage as a defined plane or volume to the movement elements of the human body as the place where the action happens. Laban created the idea of the "kinesphere" as a controllable, definable template for detecting the interval of bodily movement. He defined this concept as the personal sphere that includes movement-body, and the sphere that surrounds it, the personal space of the body. In short, the "kinesphere" is established between platonic solids and the body. Questioning the direction of bodily movement in terms of its relation with the limbs, Laban stated that the interval of movement takes place within the icosahedron, over the last point that the body can reach with its limbs without moving (Figure 1a). Marking the center of gravity of the body on the body in a three-dimensional coordinate system explains the boundaries of the "kinesphere" with a three-plane definition based on the orientation of the limbs (Figure 1b): Door Plane (Figure 1c), Wheel Plane (Figure 1d) and Table Plane (Figure 1e), (Newlove J. & Dalby J., 2004).
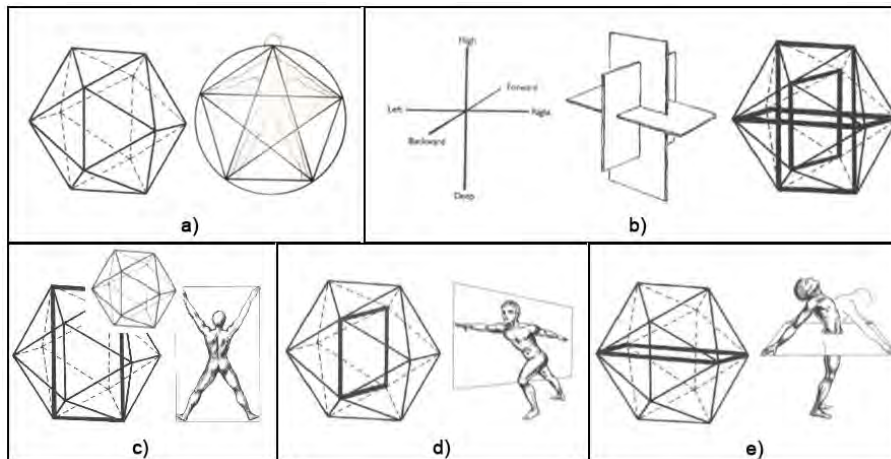
Figure 1. a) Icosahedron, A pentagonal pose showing parts of the body, b) Three planes perpendicular to each other in the Icosahedron, Planes that define the "kinesphere" in the Icosahedron; c) Door plane, d) Wheel plane, e) Table plane, (Newlove, J. & Dalby, J., 2004).

Although the "kinesphere" in the Icosahedron, as the interval of movement surrounding the body and its limbs, is defined by the relation of perpendicular surfaces determined within platonic solids, it has a dynamic and flexible structure that transforms with the change in movement-body. For this reason, it should be considered the body's own space, dynamic and shaped by the dynamics of movement, which is revealed through elements with movement-body (Moore, 2009).

Within the scope of this study, the surfaces that define Laban's "kinesphere" approach as an interval of movement are formed according to movement-body and produce space with their articulations. This interval is considered significant because of the similarities it shares with the spatial body relations questioned in the context of cinematographic spatial fiction. The kinesphere, which provides a controllable and definable template to visualize inter-surface connection codes, offers a tracked, signed, recorded, and reproduced personal sphere. As a dancer, dance designer, choreographer, architect and movement theorist, the spatial body relation that Laban questions in the discipline of dance and

"kinesphere" approach provide an experimental reading interval to the geometry-based architectural design approach for the bodily search of spatial intervals. The cinematographic space, which is explored through the movement-body experience, attaches importance to the body experience, and the discovery of new relation possibilities at all phases. An experimental approach is adopted that stretches the boundaries according to the way of reading and offers a dynamic and self-reproducing interval of representation. Non-representational theory, which questions the position of the body in representation that exists as a reflection of ideas, ideologies, perspectives, and values, criticizes the reductionist attitude that ignores the intertwined relations and human-environment interaction in life while the representation reflects reality (Thrift, 2008). It corresponds to a dynamic process in which everything is in relational possibilities (Doel, 2007). Non-representational theory is a common concept for studies aiming to reveal more-than-human, more-than-text, and relation possibilities (Lorimer, 2005). According to Nigel Thrift's (2008) non-representational approach, everything is interactive. At the same time, it offers an experimental base that allows the body-environment relation to increase. As Vanini (2015) states, non-representational theories include experimentation with their open structure to case studies, various observation methods, and new transmission channels. It is significant to make research-oriented choices rather than comparing these tools to each other (Thrift, 2008). This research uses geometry as a new transmission channel by considering the movement of the body in the time plane (Figure 2).
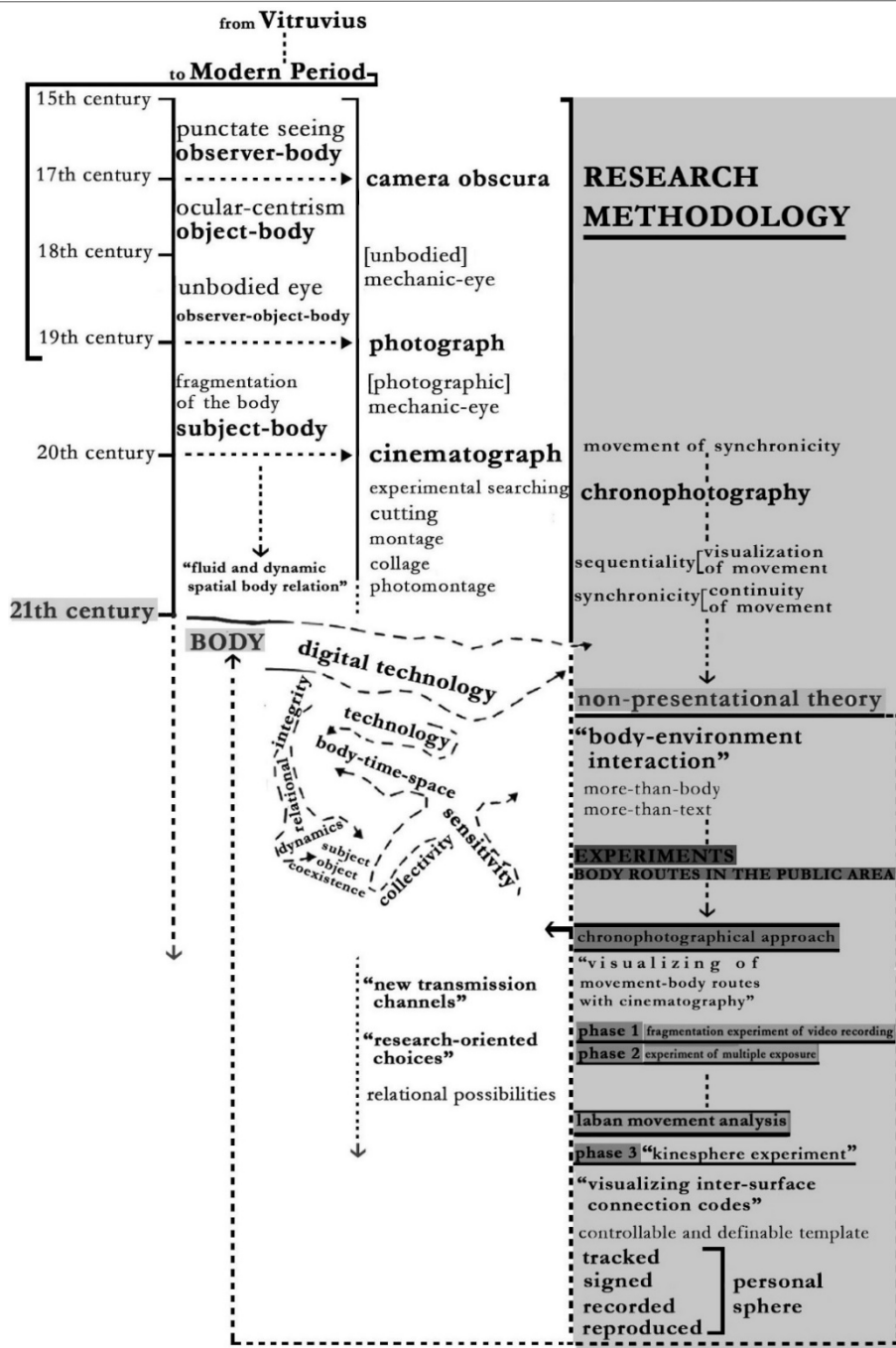
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Figure 2. Theoretical framework and research methodology diagram (Aslan & Arıdağ, 2023).

BODY ROUTES IN THE PUBLIC AREA

The purpose of this study was to question spatial possibilities with the search for an experimental space developed with the relations established between time-body-space fragments. As such, in order to reveal the possibilities of the space, Eskihisar Coastline/Turkey has been chosen as an urban space, due to its potential as a public space where the body can be observed, much like all public space and with a search for a surface exploration developed through the body routes recorded with cinematographic techniques. The observation phase was carried out during the COVID-19 pandemic, which impacted the entire world, on November 21, 2020, coinciding with the weekend, during two distinct

time periods of the day – one in the morning sequence from 10:00 to 13:00 and the other in the evening sequence from 16:00 to 19:00. The pandemic affected social interactions and the usage of public areas. Therefore, in this process where access to public spaces is limited, a public space that can be accessed in a short time was preferred for video recording. Eskihisar Coastline/Turkey as an urban coastline (Figure 3) was chosen because it is an area that is densely used on weekends during the COVID-19 pandemic and a pedestrian promenade that allows for continuous city flow and where different body-action examples can be seen.

Figure 3. a) Eskihisar Coastline/Turkey, observation and video recording test area, b) The limit of the movement-body routes in the public space that determined to in the experimental phases.

In the observation phase, body actions detected during observations made at different periods during the day on the coastline routes were recorded. Visual data were obtained about the various bodily actions produced by pedestrians. Observing the instantaneous possibilities of intensifying body flows on this promenade, examples of "Walking Body" as a periodic body-action and "Wandering Body" as a product of its periodic body-action were examined in the experimental phases.

Visualization of Movement-Body Routes: Chronophotographic Approach

The cinematographic approaches of Eadweard Muybridge and Etienne-Jules Marey, who developed movement representations by focusing on different qualities of movement, such as its phases and continuity, were used as references. Chronophotography is a cinematographic technique developed with studies on movement. Eadweard Muybridge and Etienne-Jules Marey's chronophotography approaches, which also form the basis of cinematography, are thought to form the basis of movement and time modeling of digital platforms in the current century. The continuity of movement and time can provide the opportunity to explore spatial potentials that are more sensitive to the environment, as in cinema, in a relational sense. The spatial narrative

potentials are formed by coding the body with time-movement fragments. Such a perspective enables us to grasp the environment as it is, no matter what information parameter we put into it. In the study, these approaches constituted the first two experimental phases as reconfigurable experiment bases in capturing and revealing the elements of the experience route of the body as a subject.

Eadweard Muybridge worked on chronophotography by arranging multiple photographs taken with his camera, one by one as a frame, to visualize movement. In Muybridge's chronophotographic movement approach, the continuity of the sequential frames creates a cinematographic effect and presents a sequenced narrative. The fragments added one after the other as part of the whole not only preserve their independent structures but also reveal the whole, which contains new spatial possibilities through their interrelations. In Etienne-Jules Marey's representation, which visualizes movement with all its phases, the movement, which is exposed at regular intervals in a single frame, exists in a new spatial structure, which becomes evident with the inter-fragment relation that includes simultaneous breaks. While Muybridge's purpose in movement representation is to visualize situations that the eye cannot perceive during movement, Marey's purpose is to measure the continuity of movement.

In this study, the method envisaged for the spatial approach focusing on the changes in the movement-body experience route was limited to the multiple exposure experiment phase, in which intervals of movement corresponding to their actions are examined through overexposure. This technique is preferred for surface searches developed over elements of movement as all moments are recorded and presented in synchronicity in a single frame. However, in the context of the observations made in the field and the data obtained from the video recordings, it was necessary to parameterize movement-body to track, mark, and control it. In this context, the experimental phases were structured and developed to be analyzed in the context of fragment-sequence. Chronophotography was used to visualize the movement-body routes that were observed and recorded in the fieldwork.

In the movement-body experience, routes drawn by time to produce instantaneous action are fiction specific to the body in a cinematographic context. While wandering in a city, the body advances by making cuts in the movement route through the movement experience layers coded in its memory, which enable it to continue its interaction with its range of gaze and impressions, past and present. It creates the movement from its gaze; the route of the experience is in the relation that includes continuity and succession. It produces changes in the speed, direction, and temporality of the movement such as recession, activation, stopping, advancing, and regressing. The fact that it produces the experience with the intervals of movement that it adds one after the other through cutting is called "body assembly". To analyze the surface intervals of the experience space established with the body, two examples from different

times of the day selected from the category of "wandering body" as a product of its periodic body-action were considered movement sequences. For the experience intervals produced by the cinematographic spatial fiction, two examples belonging to different times of the day selected from the category of "walking body" as a periodic body-action were evaluated in the context of a movement period. In the cinematographic spatial fiction, the possibilities of body montage, which enables the body to produce its spatial interval in the experience of movement in the city, were parameterized as 3 items to be examined by comparing them in the experimental phases:

- "The act of walking in the temporality of the city": Each movement-experience sequence produced exists by producing its time-space context. Demonstrating morning sequence and evening sequence examples of the act of walking as singular movement sequences.
- "The direction of movement-body": In body montage, the starting and ending point of the movement is determined by the movement-body route. Movement experience has a direction structured by the cuts made by the body. With the cutting and transition that the body makes in the range of vision, the experience is produced instantaneously. In cinematographic spatial fiction, the body experience can be discussed from different perspectives. The movement's direction can be constructed from different perspectives and intervals. Sequencing the fragments, side by side on a cinematographic plan with montage techniques such as symmetry, change of direction, and cutting.
- "The temporality of movement-body": The body, which moves in the direction of movement in body montage, also constructs the temporality of the experience. Combined with this succession of cuts made by the body, the experience contains a linear temporality. The continuity and succession of the movement in its direction structure the duration. In cinematographic space fiction, new temporal intervals are produced by the montage technique in which the motion fragments superimposition, juxtaposition and cutting.
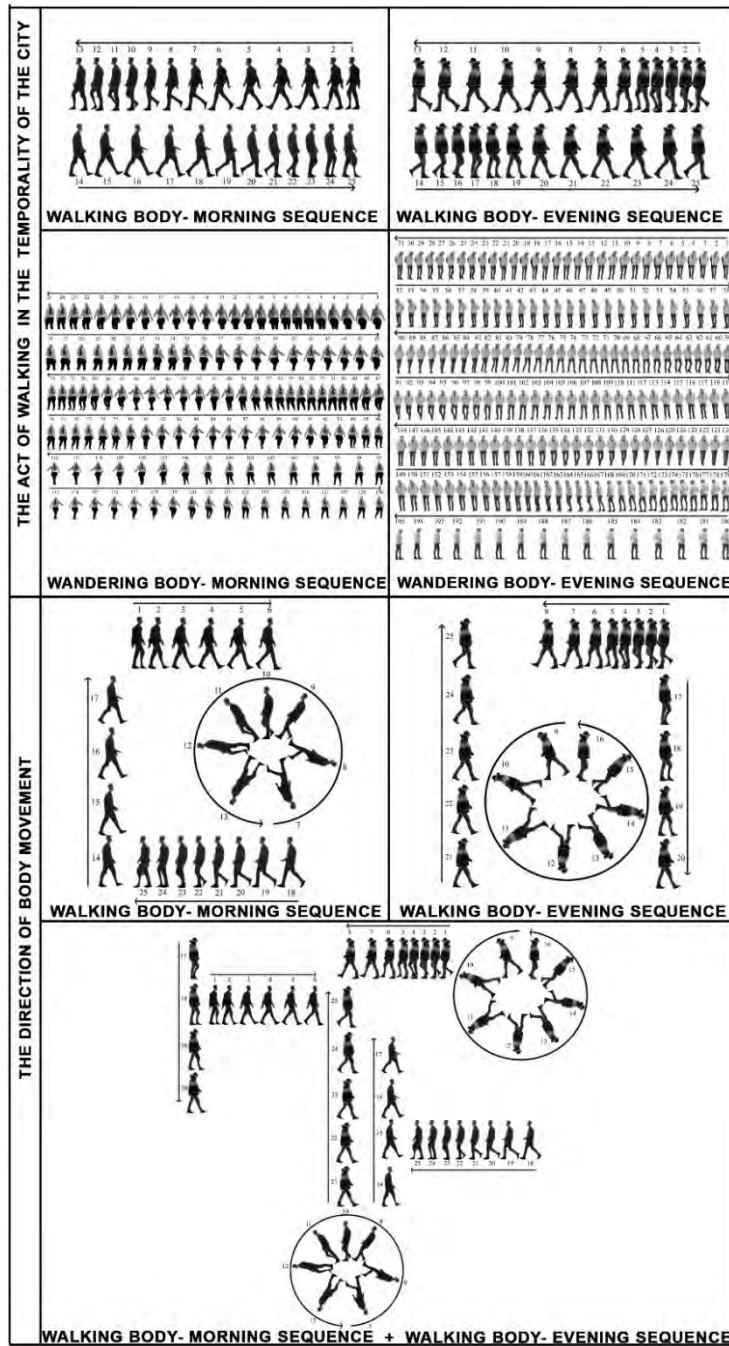
EXPERIMENTS
Fragmentation Experiment of Video Recording

Eadweard Muybridge attempted to visualize movements that cannot be captured by the human eye by posing them one after the other with short time differences, then ordering them in frames. A similarity was established between the chronophotographic movement approach and revealing the surface relations that make the spatial possibilities hidden within the movement visible. In this context, body routes recorded with video using a Canon EOS 250D 18-55 DC DSLR Digital Camera in the

public area appear as movement intervals on a series of photographs when the video is split into fragments. Attempts were made to identify spatial intervals among these photographs by coding the movement with montage techniques such as superimposition, juxtaposition, and cutting. In this context, to capture the movement fragments of the body actions, which were observed to have different movement speeds in their time-space intervals, the number of frames per second (fps) required to capture the interval speeds was determined. For this, the video recording was done at 25 fps (periodic), which is often used in cinema and thought to best mimic the movement flow of the human eye, and 50 fps (producing its period) to capture the spatial possibilities of the interactions between the movement speed in the flow of the city and with other bodies. The instantaneous probabilities observed in the fieldwork determined the duration of the video recordings. Video recording was conducted with the camera as the "mechanical-eye", which wandered around coastline as an observer and took recordings based on various factors such as daylight, human density, actions at different speeds, time zone, and angle change. Attention was paid to the time intervals determined instantaneously according to the change period of the movement, the period of completing the movement of the body, and the time the body entered the frame. All video recordings were converted to JPEG format photos using the Adobe Premiere program. The fragments were analyzed individually and sequentially using Adobe Photoshop.
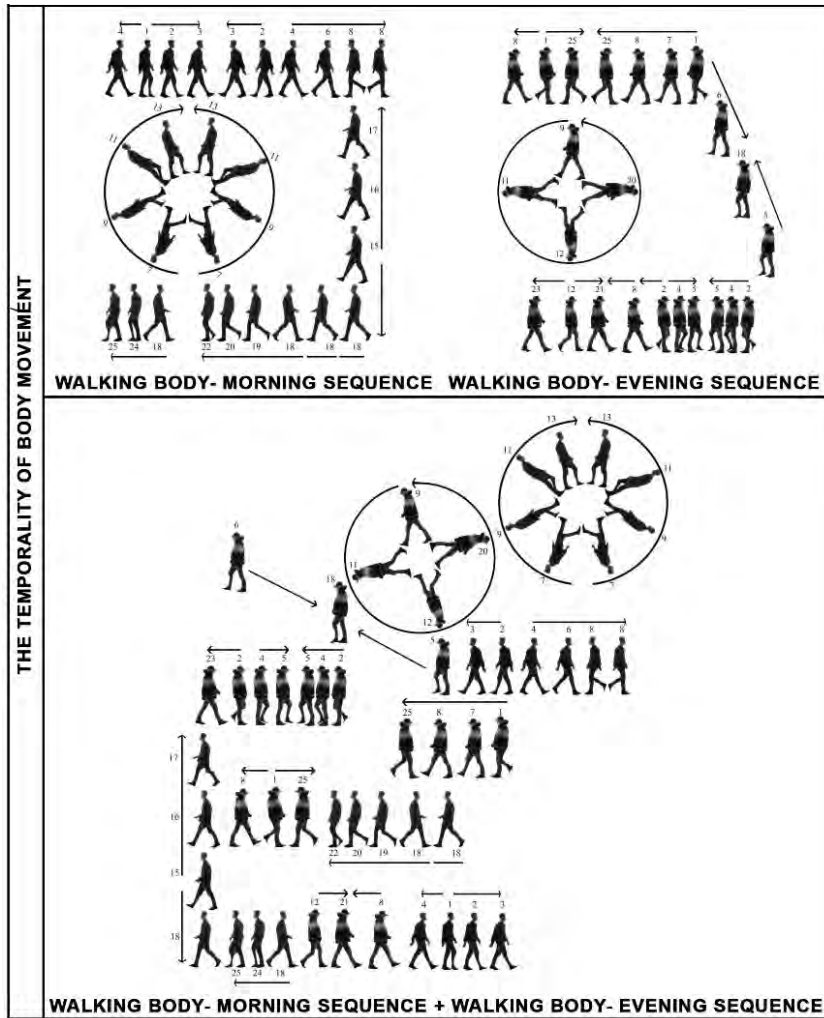
Figure 4. Phases of fragmentation experiment of video recording.

Experiment of Multiple Exposure

Developed from Muybridge's chronophotographic movement approach, the single and related sequence trials produced in the three phases of the first experiment were conducted with the multiple exposure technique. Then, based on Marey's simultaneity approach, all the fragments were brought together in a single plane (Figure 5).
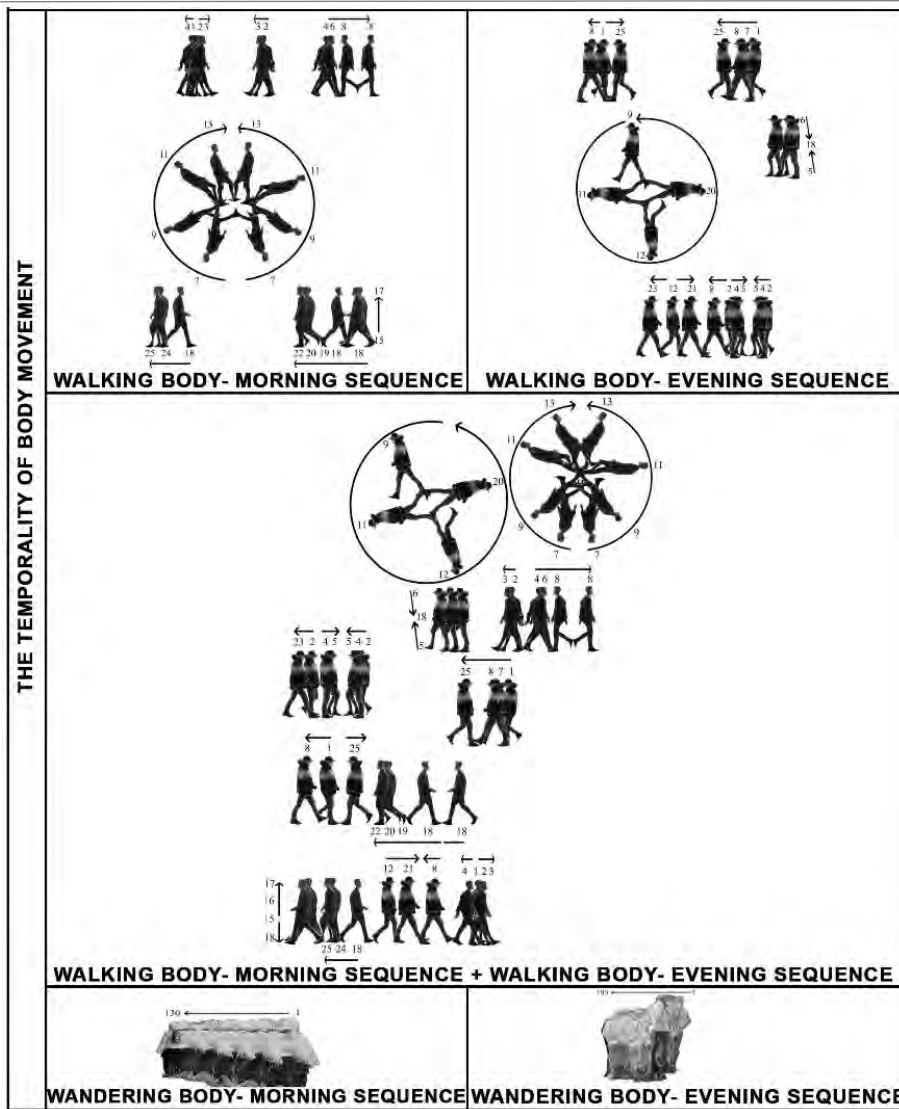
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Figure 5. Phases of an experiment of multiple exposures.

"Kinesphere" Experiment Visualizing Inter-Surface Connection Codes

In the third experiment, the "kinesphere" as a controllable, definable template for detecting the interval of bodily movement and "movement notation" were used. Body representations were reduced to standards and numerical values. The 2D representations of fragmental structure obtained in the chronophotography experiments were turned into 3D by being open to experience in the computer environment. The "kinesphere" was developed from the body's unique proportions and was turned into a body scale that visualizes the inter-surface connection codes.

Rhinoceros 3D was used to model "walking body" sequence samples in three planes (table plane, wheel plane and door plane) which intersect at the body's center of gravity, considered to determine the "kinesphere" by defining the interval of movement of the body in Laban Movement Analysis. 10 samples selected from different movement intervals within the 'walking body-morning sequence' and 'walking body-evening sequence' were modeled to visualize the cinematographic spatial narrative of the city, and the "kinespheres" revealed by movement-body

to examine the spatial ranges of both successive sequences and their relation to each other. After determining the personal intervals for each body fragment in the sequences, three-dimensional kinespheres were established for each set of 10 sequences created from these fragments. They are movement-body "kinespheres" that express the interval of movement of "walking body" as a periodic body-action samples that perform a linear and periodic action in the city. The spatial interfaces corresponding to the 3-dimensional ranges of movement of the walking body were determined with the surface articulations from the movement space "kinesphere", which denotes the interval of movement of the body by accepting the farthest point they can reach. Although this series, consisting of 10 samples created from walking-body sequences from different time periods, does not occur in linear time within the city, it contains a cinematographic structure based on the relationship established between the narrative components of the movement. Surface articulations discovered with kinespheres in Sequence 1 and Sequence 2 and their relationship with each other were applied to all 10 sequences, revealing the spatial narrative of the walking body. In this narrative, movement routes sought within the surface articulations provided by the kinesphere were obtained in a curved and multidirectional manner, encompassing rectangular intervals established by the "Table Plane", "Door Plane", and "Wheel Plane". Visualizing the spatial narrative of the walking body in the city was made possible by utilizing the curved and differently angled surfaces of the kinesphere, which extended beyond the three planes of the kinesphere, thus enabling the exploration of all possibilities (Figure 6).

795

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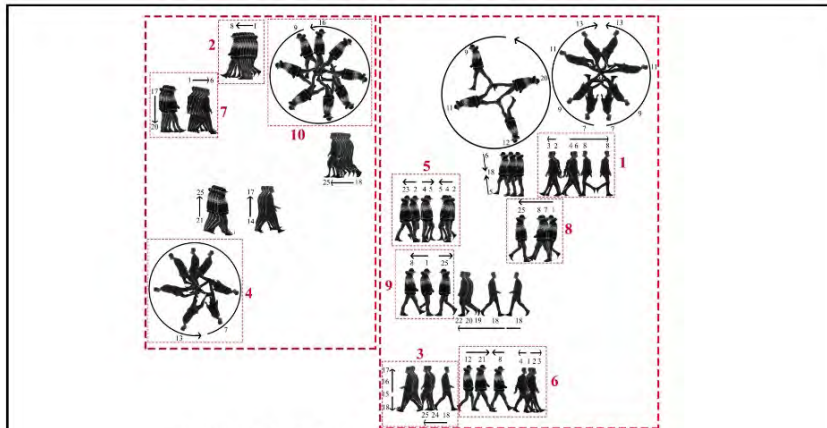
EXAMPLES OF SEQUENCES USING FRAGMENTS
IN THE "KINESPHERE" EXPERIMENT VISUALIZING INTER-SURFACE LINK CODES
WALKING BODY- MORNING SEQUENCE + WALKING BODY- EVENING SEQUENCE

CINEMATOGRAPHIC SPATIAL NARRATIVE BASE CONSTRUCTED WITH THE "WALKING BODY" FRAGMENTS OF THE CITY

WALKING BODY- MORNING SEQUENCE   WALKING BODY- EVENING SEQUENCE
THE THREE PLANES THAT DEFINE THE "KINESPHERE" OVER THE BODY'S INTERVAL OF MOTION

THE MOVEMENT-BODY "KINESPHERE" OF
SEQUENCE FRAGMENTS 1 AND 2   THE SURFACE OF THE MOVEMENT-BODY "KINESPHERE"
OF SEQUENCE FRAGMENTS 1 AND 2

MOVEMENT SPACE "KINESPHERE" OF SEQUENCE FRAGMENTS 1 AND 2
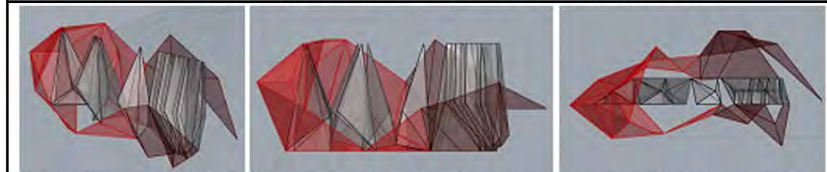
SURFACE ARTICULATIONS FORMED IN THE "KINESPHERIC" INTERVALS OF SEQUENCE FRAGMENTS 1 AND 2
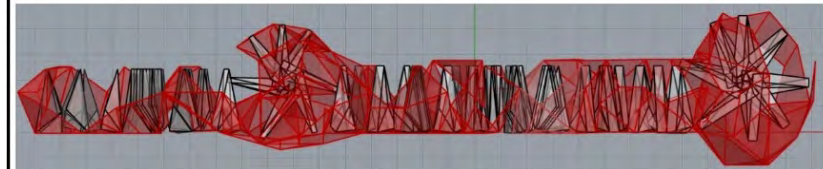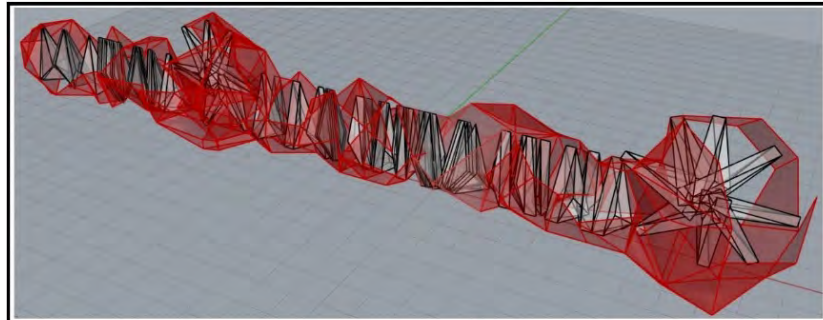
SURFACE ARTICULATIONS IN THE "KINESPHERIC" INTERVALS OF 10 SEQUENCES
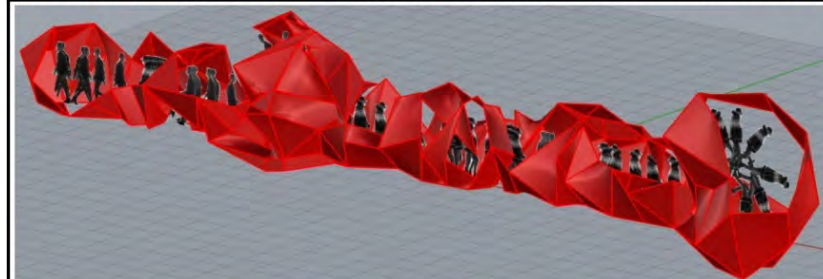
THE SPATIAL NARRATIVE OF THE "WALKING BODY" IN THE CITY
WITH SURFACE ARTICULATIONS IN THE "KINESPHERIC" INTERVALS OF 10 SEQUENCES
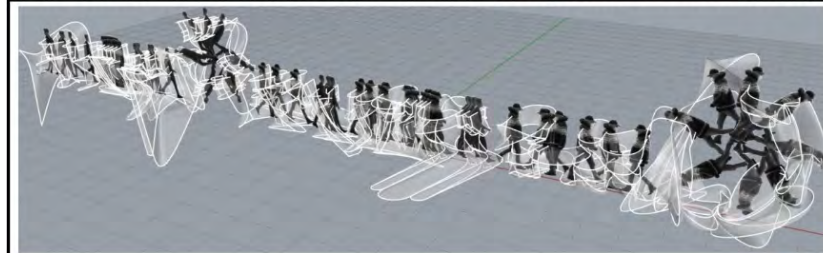
MOVEMENT ROUTE OF THE "WALKING BODY" IN THE CITY
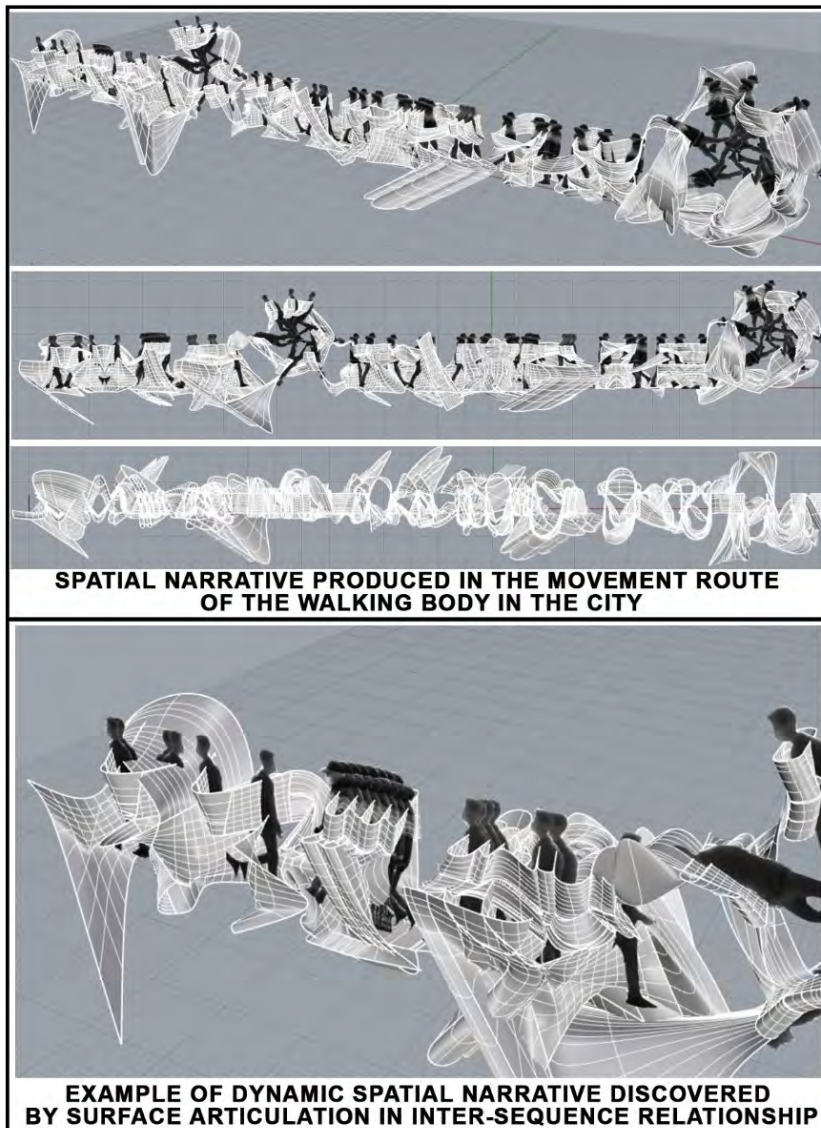
Figure 6. "Kinesphere" Experiment Visualizing Inter-Surface Connection Codes.

RESULTS

Phases of Fragmentation Experiment of Video Recording

The act of walking in the temporality of the city
"Walking Body" as a periodic body-action:
- The times to complete the movement periods are different.
- The fragmental structure formed by body routes has different intervals.

"Wandering Body" as a product of its periodic body-action:
- The fragmental structure in which it cuts in producing its periods is the body assembly.
- The fragmental structure of body routes in the temporality of the city produces the different intervals of movement.

The direction of movement-body

"Walking Body" as a periodic body-action:

- Within the sequencing of the fragments in different relation possibilities such as symmetry, change of direction, and cutting, different spatial intervals that reproduced the experience in a cinematographic fiction has revealed.
- It generates new relation possibilities of sequences constructed by cuts of fragments that preserve their singular structure.
- The body that produces the experience appears to contain more intervals from the singular point of view.

The temporality of movement-body

"Walking Body" as a periodic body-action:

- Interruptions, additions, jumps, backward, and forwards are made in the temporality of the movement with montage techniques about the possibilities of discarding, repetition, and repositioning of the fragments.
- Different temporal intervals of the movement are produced by the fragmentation of the succession of the fragments.
- It is observed that the fragments are reproducible with different readings on a cinematographic plane.
- In the morning and evening sequences are handled together, observed that each walking body fragment preserves its singular structure, and temporal intervals have produced with cinematographic fiction.

Phases of The Experiment of Multiple Exposures

The act of walking in the temporality of the city

The sequence of the fragments in the movement-body experience makes the body assembly visible simultaneously.

The direction of movement-body

"Walking Body" as a periodic body-action:

- Observed that the fragmental structure, both as singular experiences and in the new relation possibilities established between them, contains new sequence intervals that refer to surface articulations, which develop through movement-body experience.
- Although it bases on periodic repetition, it can produce new time-space contexts according to the movement fragments.

"Wandering Body" as a product of its periodic body-action:

- Body montage based on the succession of fragments can produce surface relations limited to their interval.

The temporality of movement-body

"Walking Body" as a periodic body-action:

- It can be reproduced synchronously in a new fiction by associating different fragments.

"Wandering Body" as a product of its periodic body-action:

- It retains the structure of the second phase of the experiment, in which the sequence of fragments is handled synchronously without temporal interference.
- New movement sequences are formed with assembly techniques produced by different sequences.

"Kinesphere" Experiment Visualizing Inter-Surface Connection Codes

- Body routes can be tracked, recorded, analyzed, and edited with the "kinesphere" that is considered the body scale.
- It reveals different intervals with the surface articulations that contain the movement interval part-whole relation possibilities have produced.
- In the space narrative, which consists of 10 cinematographic plans, the surface relations obtained by the relation between the "kinespheres" determine the "kinesphere" of the experience as the space that the walking body in the city can reach.
- Planar approach that considers the intervals of movement of the kinesphere in the aggregate, defines the interval of movement handled over the last point of a movement that the body can reach.
- The route drawn by limbs of the body that move is revealed, surface articulations of the continuity on routes marked on created fragments.

DISCUSSION

In the first experiment (phases of fragmentation experiment of video recording), the movement of the fragments was parameterized and examined, then singular and fragmented movement sequences were produced by arranging them one under the other, side by side (Figure 4). In the second experiment (phases of the experiment of multiple exposures), it was observed that space intervals could be examined with a continuous and holistic approach by overlapping the fragments (Figure 5). In both experimental phases, it was understood that the experience of movement could be reproduced from different perspectives by considering the direction and time of the movement in the new relation possibilities established with the fragments. It has been concluded that the singular space of the "wandering body" as a product of its periodic body-action samples examined in the field through "body montage" can be increased by multiple readings in the "walking body" as a periodic

800

body-action samples as a cinematographic spatial fiction. Thus, it can be concluded that probabilities can produce new connections and intervals with relation probabilities established with fragments. It can be said that movement fragments handled with a cinematographic approach can produce more relation possibilities than the singular experience of the body.

The cinematographic approach used in the "kinesphere" experiment, visualizes the inter-surface connection codes as a body scale and refers to the revealing of surface articulations in the study of the spatial possibilities revealed by movement elements based on movement-body. However, considering that the search for space to be produced within the limitations of the "kinesphere" defined by geometric surfaces is insufficient to convey the dynamic and fluid nature of movement, the movement-body route is emphasized, and the route drawn by the moving limbs of the body is marked. Although the fluidity of the route refers to the interval of movement, it has been observed in this experimental phase that all the space possibilities to be produced remain within the interval of the "kinesphere". For this reason, starting from a space understanding that goes beyond representation and produces intervals, a dynamic spatial narrative was developed from the interval of movement of the body with the surface articulations increased in the route through the example of sequence 1 and 2 examined in the "kinesphere" experiment (Figure 6). The dynamic spatial narrative discovered in the increased surface articulations was analyzed in a fragmental relation in the context of cinematographic spatial fiction and transformed into urban furniture image design samples that would support the urban flow (Figure 7). It suggests that performative urban furniture is produced with the geometry-based architectural design approach developed within the scope of the study. Taking actions in the city as a reference, the possibilities of change can be seen, and urban furniture can be created in movement-body routes by needs moving together with the body in the cities of the future.

801

802

THE PRODUCTION PHASES OF SPATIAL INTERVALS IN SEQUENCE SAMPLES 1 AND 2 WITH MOVEMENT-BODY FRAGMENTS

URBAN FURNITURE IMAGE DESIGN AS GEOMETRY-BASED A DYNAMIC SPACE NARRATIVE IN THE RELATIONSHIP BETWEEN SEQUENCES

3 planes showing the interval of movement of the body with the "kinesphere" of the "walking body-morning sequence"

3 planes showing the interval of movement of the body with the "kinesphere" of the "walking body-evening sequence"

The surfaces of the movement-body "kinesphere" of sequence fragments 1 and 2

ELEVATION   PERSPECTIVE   PLAN

The surfaces of the movement-body "kinesphere" of sequence fragments 1 and 2

Surface articulations formed in the "kinespheric" intervals of sequence fragments 1 and 2

The spatial narrative of the body walking in the city with the surface articulations formed in the "kinespheric" intervals of sequences 1 and 2

The movement route of the walking body in the city observed in sequences 1 and 2

Figure 7. Urban furniture image design samples as a dynamic spatial narrative discovered by surface articulation in the production phases of spatial intervals with movement-body fragments and the relationship between sequences.

Urban furniture image design samples as a geometry-based dynamic spatial narrative are based on sequences between the relationship movement-body fragments. These images as a dynamic spatial usage proposal can be developed from the body's interval of movement. The production of space based on ideal body measurements, which have been standardized since the Vitruvian Period and produced depending on

803

body dimensions, intervals of movement, and usage styles, has an ecological and sustainable quality as it supports the interaction of the body with the environment in which it is located. Designing space corresponding to the action required by the body with the surface articulations sought in the movement route of the body will give the space a reproducible and transformable quality. The ecological and sustainable structures of the environmentally sensitive and interacting space can be achieved with an architectural design strategy that produces a flexible and dynamic spatial fiction, corresponds to the needs emerging in everyday life, and structures it by being included in the city. Various spatial intervals belong to the city and can be produced by examining and reproducing the movement intervals in which the observed actions of the body in movement in the city are sheltered by examining the fragmental relation possibilities.

CONCLUSION

The two-dimensional movement fragments obtained in the first two experimental phases "phases of fragmentatioan of video recording" and "phases of the experiment of multiple exposures" revealed spatial connection codes and the relations produced between them for the direction and temporality of the movement. In the third experimental phase "kinesphere experiment visualizing inter-surface connection codes", it was possible to increase the spatial intervals by opening them to experience to discover new three-dimensional relations in the computer environment. A dynamic spatial narrative was discovered in the surface articulations augmented by the topology produced by the movement-body experience route. The dynamic spatial narrative that supports urban flow has been transformed into urban furniture image design samples by examining it in a fragmental relation in the context of cinematographic spatial fiction. The approach developed in the study has an experimental reading interval and the connections established within the scope of movement-body experience carry a new perspective. The interrogative process, which deals with the movement-body experience in the context of its relation with the city, aims to explore the spatial possibilities of the movement experience instead of developing a formulation over the experimental phases. This study produced an experimental reading style to increase the spatial sensitivity developed by the body's unique ratio and proportion (Results in chapter 4).

Surface articulation, explored through the movement-body experience, defines its own space, and gives reference to performative urban furniture through routes that differ according to needs. This urban furniture articulates flow in the city. In the architectural design proposal, the body-movement-surface relation is transferred to the space, and this information is used to produce the space. By making information understandable, performative urban furniture images become visible as architectural design. Cinematographic spatial fiction offers a geometry-based reading interval developed from the ratio-proportion of the body

804

to the production intervals presented to the architectural design in the context of time-space through the produced urban furniture image. The codes of the architectural design strategy were produced in the experimental phases of this study. With the introduction of a generative system proposal, the expectation achieves its purpose. The concept of space derived from the interval of movement of the body will enable the production of intervals corresponding to the spatial uses needed in the city where the body is in movement. The unique reading intervals offered by cinematographic spatial fiction to architectural design are analyzed through the urban furniture image developed at the end of the experimental phases. Aiming to incorporate the practices of thinking and reading in the context of geometry-based architectural design, new relation possibilities should be further researched in the cinema-architecture inter-section in future studies. Urban furniture designs are proposed that respond to the new experiences revealed by digital technology in the urban flow and the actions needed in public spaces in the future. Ecological, sustainable, and interactive designs are sensitive to the environment, can produce energy, can structure the urban fiction with their body-interactive performative surfaces, and can offer solutions to transforming and changing needs. However, the acceptance of movement-body, with its unique proportions, as a defining parameter in the reading of space in the current age is similar to the concepts of change, transformation, and speed in digital technology. The interface designed in this study is expected to offer a solution proposal that can be developed from the body scale for the urban furniture needed in public spaces in the cities of the future. It is expected that the fieldwork and method used in this study, which aimed to investigate and make visible the movement-body experience in defining the space in the cities of the future, will offer a new reading interval and lead to the next studies.

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NOTES

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806

Resume

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Assessment Method of Modern Buildings Constructed in a Historical Area; as a Case Study İMÇ Blocks

Funda Gençer *   iD

Abstract

The addition of new modern layers to the historic urban settings is a significant issue in conserving the historic area's characteristics. Thus, a method of evaluation for modern buildings built in historical areas is being devel oped. The objective includes assessing the maintenance of the historic area's qualities and designing qualified modern buildings. These two issues were evaluated by assessing the example of İstanbul Drapers and Yard Goods Bazaar, İMÇ blocks. First, historical house settlements in the construction area of İMÇ (1933) and then characteristics of İMÇ blocks (1967) were analyzed. In terms of mass proportions, the position of courtyards, circulation areas, street and square relations, and vistas, site plan organizations from 1933 and 1967 were compared, while the proportions and architectural details of the façades were compared. The assessment criteria for the evaluation of modern buildings and their impact on historical areas were determined based on international preservation standards and charters. The conservation criteria include respecting the qualities, vistas, and landmarks of existing historic structures, being recognizable and reversible, responding to the demands of the area, and providing new views, juxtapositions, and textures. Modern heritage criteria include technical, land use, aesthetic, historical, socioeconomic, intangible, canonical, and reference qualities.

As a result, it is seen that the İMÇ blocks were designed in harmony with the environment and increased the spatial quality of the area. Even though the İMÇ blocks are large-scale due to architectural constraints, the orientation of the blocks, the placement of courtyards leading to the Süleymaniye Mosque, and the transverse and longitudinal continuous circulation between the blocks respected historical texture. Despite the size of the masses, their heights and architectural elements are consistent with the traditional house layout.

808

INTRODUCTION

Characteristics of historic towns have changed along with modern movements to meet residents' requirements. To maintain the qualities of a historical region and develop qualified modern buildings, however, the addition of new modern layers to the old urban environment are crucial topic that architects and conservators consider.

In literature, there are different discussions about modernity. The specific information was acquired through research conducted globally on the idea of modern heritage and its standards, such as Council of Europe Committee of Ministers (1991); Cook & Richards (1993); UNESCO (2003); Oers (2003); Prudon (2008); ICOMOS (2011b); Gallagher (2011) and Szmygin (2012), and national sources as Sözen (1996), Kayın (2001), Zenger & Karatosun (2001), Bozdoğan & Kasaba (2005), Madran (2006), Yavuz (2008), Omay Polat & Can (2008), Ergut (2009). These sources discussed different values about modernity: technological, social, artistic, aesthetic, canonic, and reference value. Technological value focuses on material and technology; social value searches the effect of the building on social texture and living circumstances; artistic and aesthetic value includes composition, proportions, scale, material, and details. The contribution of the building to its construction period, modernity, and architectural principles are in the scope of the canonic value. The reference value is the extent to which it has an impact on the following modern buildings (Cook & Richards, 1993).

The principles of new designs in a historic area were tried to be identified according to listed international preservation standards and charters:

•Venice Charter (ICOMOS, 1964)

•Resolutions of the Symposium on the Introduction of Contemporary Architecture into Ancient Groups of Buildings at the 3rd ICOMOS General Assembly (ICOMOS, 1972)

•Resolutions of the Symposium Devoted to the Study of "The Streetscape in Historic Towns (ICOMOS, 1973)

•The Resolutions of Bruges: Principles Governing the Rehabilitation of Historic Towns. (ICOMOS, 1975a)

•Resolutions on the International Symposium on the Conservation of Smaller Historic Towns at the 4th ICOMOS General Assembly (ICOMOS, 1975b)

•Recommendation Concerning the Safeguarding and Contemporary Role of The Historic Area; (UNESCO, 1976)

•Charter for the Conservation of Historic Towns and Urban Areas (Washington Charter 1987) (ICOMOS, 1987)

•Charter on the Built Vernacular Heritage (ICOMOS, 1999)

•Vienna Memorandum (UNESCO, 2005)

•The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns, and Urban Areas (ICOMOS, 2011a)

•Burra Charter-The Australia ICOMOS Charter for Places of Cultural Significance (Australia ICOMOS, 2013)

The latest documents (UNESCO, 2005; ICOMOS, 2011a, 2013) advocated for using impact studies, principles, or initial assessments before the interventions not to impact the significance and setting of the historic area. The criteria in the documents are values, quality, quantity, coherence, balance and compatibility, and cultural diversity (ICOMOS, 2011a). In this context, an initial assessment analyzing both the qualities of the modern building and its impact on the historic settlement is essential to sustain the historic area's significance and interpret the area positively. Therefore, an assessment method aims to develop for evaluating modern buildings constructed on a historical site. The objective includes assessing the maintenance of the historic area's qualities and designing qualified modern buildings. Analysis of the previous settlement and the İMÇ buildings at the time of its construction was done. The information about İMÇ blocks was gathered from the sources; Özeren (2008); ISMD (2011); Cünük et al (2013), Tekeli (2012, 2018, 202), Kök (2016), and İMÇ (2022). Previous and current site plan organizations are compared with each other in terms of mass proportions, the position of courtyards, circulation areas, street, and square relations and vistas, while façade organizations were compared in terms of mass proportions, the position of architectural elements such as projections and material usage. The assessment criteria, based on standards and charters, for the evaluation of modern buildings and their impact on historical areas were determined. The İMÇ blocks built in a historical area were evaluated using the established criteria.

Literature Review for the Identification of Assessment Criteria

To determine assessment criteria for the evaluation of modern buildings and their impact on historical areas, conventions, regulations, standards, charters, and previous studies were searched.

New Designs in Historic Settings

Historic sites are rich in cultural assets, including social, historical, and architectural values. The design of new additions to a historic area is crucial since they also frequently have aesthetic significance. Before adding a new modern structure in a historically significant area, the area should be identified, and the values of the area should be defined to preserve these qualities with new structures. There are numerous items in the conventions, standards, declarations, and charters about the interventions of historic areas (The Getty Conservation Institute, 2015).

•Venice Charter (ICOMOS, 1964)

Article 12. Replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence.

•Resolutions of the Symposium on the Introduction of Contemporary Architecture into Ancient Groups of Buildings at the 3rd ICOMOS General Assembly (ICOMOS, 1972)

In 1972, Icomos published one of the earliest international documents on the integration of modern architecture with historic architecture. The document supports the ide: *contemporary architecture should employ materials of its own time without affecting the qualities of the surrounding historic environment in terms of "mass, scale, rhythm, and appearance. İmitations should be avoided because they undermine the authenticity of historic sites.*

•Resolutions of the Symposium Devoted to the Study of "The Streetscape in Historic Towns (ICOMOS, 1973)
New construction and urban features has are incompatible with the neighborhood's historic streetscape have been forbidden by Icomos (1973). Preserving the size of allotments inside the urban fabric encourages preservation.

•The Resolutions of Bruges: Principles Governing the Rehabilitation of Historic Towns. (ICOMOS, 1975a)
Icomos (1975) advocates that the fabric, structure, and history of historic towns are not destroyed. If its character is to be preserved, the layout, density, and dimensions of the town must be retained.

•Resolutions on the International Symposium on the Conservation of Smaller Historic Towns at the 4th ICOMOS General Assembly (ICOMOS, 1975b)
Icomos (1975b) advocates any construction adheres to the current scale and preserves the surroundings' character, relationship to the terrain, and prominent structures.

•Recommendation Concerning the Safeguarding and Contemporary Role of Historic Areas (UNESCO, 1976)
Article 28. Particular care should be devoted to regulations for and control over new buildings so as to ensure that their architecture adapts harmoniously to the spatial organization and setting of the groups of historic buildings. To this end, an analysis of the urban context should precede any new construction not only so as to define the general character of the group of buildings but also to analyze its dominant features, e.g. the harmony of heights, colours, materials and forms, constants in the way the facades and roofs are built, the relationship between the volume of buildings and the spatial volume, as well as their average proportions and their position. Particular attention should be given to the size of the lots since there is a danger that any reorganization of the lots may cause a change of mass, which could be deleterious to the harmony of the whole.
Unesco (1976) includes an initial assessment of the context to determine the basic principles that will guide the design. This analysis shall examine dominant features, such as *the harmony of heights, colors, materials and forms, constants in the way the facades and roofs are built, the relationship between the volume of buildings and the spatial volume, as well as their average proportions and their position*, with particular attention given to lot size.

•Washington Charter (ICOMOS, 1987)

Qualities to be preserved include the historic character of the town or urban area and all those material and spiritual elements that express this character, especially:

a) Urban patterns as defined by lots and streets.

b) Relationships between buildings and green and open spaces

c) The formal appearance, interior and exterior, of buildings as defined by scale, size, style, construction, materials, color and decoration.

d) The relationship between the town or urban area and its surrounding setting, both natural and man-made; and

e) The various functions that the town or urban area has acquired over time.

•Charter on the Built Vernacular Heritage (ICOMOS, 1999)

Icomos (1999) supports measures that "*maintain the integrity of the sitting, the relationship to the physical and cultural landscape, and of one structure to another. Consistency of expression, appearance, texture, and form throughout the structure and the consistency of building materials*" are determined as parameters to conserve historic areas.

•Building in Context: New Development in Historic Areas (English Heritage and Cabe, 2001)

A successful new building addition in a historical area will

> ➢ relate well to the geography and history of the place and the lie of the land.
> ➢ sit happily in the pattern of existing development and routes through and around it.
> ➢ respect important views.
> ➢ respect the scale of neighboring buildings.
> ➢ use materials and building methods that are as high in quality as those used in existing buildings.
> ➢ create new views and juxtapositions which add to the variety and texture of the setting.

•Vienna Memorandum (UNESCO, 2005)

Article 18. Decision-making for interventions and contemporary architecture in a historic urban landscape demand careful consideration, a culturally and historic sensitive approach, stakeholder consultations and expert know-how. Such a process allows for adequate and proper action for individual cases, examining the spatial context between old and new, while respecting the authenticity and integrity of historic fabric and building stock.

Article 26. As a general principle, proportion and design must fit into the historic pattern and architecture, while removing the core of building stock worthy of protection ("façadism") does not constitute an appropriate means of structural intervention. Special care should be taken to ensure that the development of contemporary architecture in World Heritage cities is complementary to the values of the historic urban landscape and remains within limits in order not to compromise the historic nature of the city.

811

•The Valletta Principles for the Safeguarding and Management of Historic Cities, Towns, and Urban Areas (ICOMOS, 2011a)

Values, quality, quantity, coherence, balance, compatibility, time, method, scientific discipline, governance, multidisciplinary and cooperation, and cultural diversity are some of the criteria that are presented here.

•Burra Charter (Australia ICOMOS, 2013)

Article 15.2. Changes, which reduce cultural significance, should be reversible, and be reversed when circumstances permit. Reversible changes should be considered temporary. Non-reversible change should only be used as a last resort and should not prevent future conservation action.

Article 22.1. New work such as additions to the place may be acceptable where it does not distort or obscure the cultural significance of the place or detract from its interpretation and appreciation. New work may be sympathetic if its siting, bulk, form, scale, character, colour, texture, and material are like the existing fabric, but imitation should be avoided.

Article 22.2. New work should be readily identifiable as such.

The Burra Charter suggests an assessment procedure. The assessment should refer to the place's management plans and statement of heritage significance. Such alterations, extensions, or new construction should be evaluated for how they affect the location's cultural value. If necessary, design changes may be needed to mitigate such effects.

In literature, the buildings constructed in a historical area or adjacent to a historical building are analyzed in terms of their effect on the perception of the historic site or building in terms of mass and facade characteristics, circulations, scale, rhythm, appearance, vistas, construction technique, material usage, and architectural elements, (English Heritage and Cabe, 2001 and studies of Dennis, 2008; Parson, 2010; Bilgin Altınöz, 2010; Yüceer & İpekoğlu, 2012; Rıza & Doratlı, 2015; Mısırlısoy, 2017).

Identification of Modern Heritage

The Modern Period begins with the termination of the Medieval Age and the birth of Humanism. It has been traced back to the mid-18th century, to the Age of Reason, and the Industrial Revolution's beginning (Aslanoğlu, 1988). Since the end of the nineteenth century, architecture and urban planning have undergone serious changes due to the industrial revolution. New materials, the transformation of construction techniques, and new uses were introduced. This trend has accelerated as technological progress to meet the needs of contemporary society (Council of Europe Committee of Ministers, 1991). According to scholars, the origins of Modern Architecture have extended back to different periods. The Modern Period begins with the termination of the Medieval Age and the birth of Humanism. It has been traced back to the mid-18th century, to the Age of Reason, and the Industrial Revolution's beginning (Aslanoğlu, 1988). Szmygin (2012) identifies modern buildings as "functionalist" architectural and urban sites constructed to express a particular ideological philosophy.

Buildings from the 20th century are numerous and have a variety of styles; they represent both traditional and modernist principles. Except for a few pioneering structures, 20th-century construction is not recognized as a modern heritage. By highlighting the qualities and diversity of modern heritage's various forms, we can better our knowledge and comprehension. (Council of Europe Committee of Ministerial, 1991). According to modern conservation principles, no standards would prevent any historical component from being classified as protected heritage. Such criteria cannot be based on a structure's age, purpose, construction conditions, material, or form (Szmygin, 2012). Therefore, lots of studies have been carried out for the identification of modern heritage. There were some organizations established for this purpose (UNESCO, 2003):

- International Scientific Committee on Twentieth-century Heritage, ISC20C
- International Committee for Documentation and Conservation of Buildings, Sites, and Neighborhoods of the Modern Movement, DOCOMOMO
- The International Committee for the Conservation of the Industrial Heritage, TICCIH
- The International Union of Architects, UIA

DOCOMOMO, the international organization initiated in 1988 for the documentation and conservation of buildings and sites of the modern movement, was invited in 1992 by ICOMOS to produce a report on the heritage of the modern movement as it relates to the World Heritage List (UNESCO, 2003).

In October 2001, UNESCO organized a Meeting at Paris Headquarters within the scope of the modern heritage concept. Some new ideas for the identification of modern heritage were developed in the meeting:

- Frampton (2003) presented some issues about modern heritage as urbanity, identity, and intervention, which can be used in the definition of criteria and strategies for conservation.
- Another contribution is made by Bergeron (2003), about industrial heritage. He suggests evaluating this architecture about specific criteria that relate to production.
- Cantacuzino (2003) examines the creation of capital cities and university complexes. He also considers the importance of planning and dedication to a social program as being a true characteristic of the twentieth century. Another issue specific to the modern era is mobility.
- Boelens (2003) considers that transportation and communication are among the most important factors that determine modern society today.
- Muramatsu & Zenno (2003) discussed that local circumstances as economy, social life, culture, policy, or climate, affect assessing and selecting properties of the 20th century (UNESCO, 2003).

814

As a result, a broader definition was offered for authenticity, which included the authenticity of the idea, form, structure details, and materials in the meeting.

Different associations tried to identify their criteria for modern heritage:

Selection Criteria 1:

In 1991, a meeting was carried out to identify a selection of modern heritage the modern Council of Europe Committee of Ministers. The specific criteria are based on the following considerations (Council of Europe Committee of Ministers, 1991)

- *the desirability of acknowledging the value of significant works taken from the whole range of styles, types, and construction methods of the twentieth century.*
- *the need to give protection not only to the works of the most famous designers in a given period or style of architecture but also to less well-known examples which have significance for the architecture and history of the period.*
- *the importance of including, among the selection factors, not only aesthetic aspects but the contribution made in terms of the history of technology and political, cultural, economic and social development.*
- *the crucial importance of extending protection to every part of the built environment, including not only independent structures but also duplicated structures, planned estates, major ensembles and new towns, public spaces and amenities.*
- *the need to extend protection to external and internal decorative features as well as to fittings and furnishings which are designed at the same time as the architecture and give meaning to the architect's creative work (Council of Europe Committee of Ministers, 1991).*

Selection Criteria 2:

In 2011, modern heritage criteria were identified in the Madrid Document with the International Conference, Approaches for the Conservation of the Twentieth Century Architectural Heritage, by ICOMOS.

Article 1: Identify and assess cultural significance.

1.1: Use accepted heritage identification and assessment criteria.

The architectural heritage of this century is a physical record of its time, place and use. Its cultural significance may rest in its tangible attributes, including physical location, design, construction systems and technical equipment, fabric, aesthetic quality, and use, and/or in its intangible values, including historic, social, scientific or spiritual associations, or creative genius.

1.2: Identify and assess the significance of interiors, fittings, associated furniture and art works.

To understand the architectural heritage of the twentieth century it is important to identify and assess all components of the heritage site, including interiors, fittings, and associated art works.

> *1.3: Identify and assess the setting and associated Topography.*

To understand the contribution of context to the significance of a heritage site, its associated Topography and setting should be identified and assessed.

Selection Criteria 3:

In 2011, another study for selection criteria of modern heritage was prepared by the National Register of Historic Places in America (Gallagher, 2011):

- *That are associated with events that have made significant contribution to the broad patterns of our history; or*
- *That are associated with the lives of persons significant in our past; or*
- *That embody the distinctive characteristics of a type, period, or method of construction, or that represent the works of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or*
- *That has yielded, or may be likely to yield, information important in prehistory or history.*

According to the Icomos Turkey Architectural Heritage Protection Declaration (ICOMOS, 2013), modern architectural heritage values for Turkey are originality, integrity, historical value, documentary value, aesthetic and artistic value, technical and technological value, group value, uniqueness value, use value, and folkloric value. The spatial organization of a modern building, material usage, architectural details, relationships between the building and its surroundings, and the building's capacity to reflect the characteristics of the culture were all discussed by Kayın (2001). Historical relevance, architectural typology, construction technology, the architect's concept of building preservation, and the preservation of award-winning structures were the five subheadings discussed by Zenger & Karatosun (2001). Madran (2006) listed the following values: continuity, memory, originality, identity, architectural value, utilitarian and economic value. The parameters of the building's canonical status and its complementing values are also discussed.

CASE STUDY BUILDING; İMÇ BLOCKS

İMÇ Blocks, also named *İstanbul Manifaturacılar Çarşısı, İstanbul Manifaturacılar ve Kumaşçılar Çarşısı, İstanbul Müzik Çarşısı and İstanbul Plakçılar Çarşısı*, is a bazaar constructed in the 1960s in Süleymaniye, historic peninsula, İstanbul (İMÇ, 2022).

Istanbul Drapers and Yard Goods Bazaar were built at the request of drapers during Turkey's 1960s modernization period. Since their erection, İMÇ blocks have housed various business activities. However, after a while, the shops closed because of the economy. The 2007 Preservation of Istanbul Historic Peninsula concerning Law Number 5336, Presentation by Renovation and Utilization by Revitalization of Deteriorated Immovable Historical and Cultural Properties, called for the demolition of the blocks. Thus, it is crucial to discuss İMÇ blocks regarding contemporary heritage values and how they affect the surrounding historical region.

Site Characteristics

İMÇ blocks were in Süleymaniye Quarter in the historical peninsula (Figure 1). Süleymaniye Quarter is one of the areas in the İstanbul World Heritage Site accepted in 1985. Süleymaniye World Heritage Site covers Süleymaniye, Vefa, and Vezneciler districts around Süleymaniye Complex and Şehzade Mehmed Complex, forming an indicative point in urban silhouette on a hill dominant over the Golden Horn (ISMD, 2011). Suleymaniye Mosque and its associated Area World Heritage Site were declared a site by the Ministry of Culture in 1977 and put under conservation. In 1995, the Süleymaniye district was defined as an urban and historic site according to the decision of Istanbul No. 1 Conservation Board of Cultural and Natural Properties (ISMD, 2011) (Figure 1).

Figure 1. İstanbul Historic Peninsula ((Revised from Yandex Map with İstanbul Historic Peninsula Site Management Plan (ISMD, 2011))

The blocks are at the west border of Süleymaniye Mosque, along 1 km next to Atatürk Boulevard and facing the Zeyrek district. In the middle of the blocks, Şep Sefa Hatun Mosque is located. On the southern part, The Valens Aqueduct belonging to the Roman period is found (Figure 2).

Figure 2. Location of İMÇ blocks (Revised from Yandex Map)

Historical Background

In Süleymaniye District, there were monuments belonging to the Roman, Byzantine, and Ottoman periods and traditional Ottoman houses. The project area had been a vital buffer zone connecting Zeyrek and Süleymaniye in the 19th century. In the second part of the 20th century, due to the number of immigrants, workshops, and residences for single males increased, and the area started to be destroyed (Eyüpgiller, 2013).

Saraçhane Fire

On August 23, 1908, there was a big fire in the location of İMÇ Blocks. Many historic houses and monuments were lost (Saner et al, 2007). In 1944, a boulevard, designed by Henri Prost, a city planner responsible for city planning of İstanbul, was constructed in this buffer zone by executing a lot of historical monuments and houses. This boulevard's construction also destroyed the historical texture damaged by fire (Figure 3). The buildings executed before construction of boulevard were Oruç Gazi Mescidi, Firuz Ağa Mescidi, Sekbanbaşı İbrahim Ağa Mescidi, Hoca Teberrük (Yahya Güzel) Mescidi, Papasoğlu Mescidi, Voynuk Şücaeddin Mescidi, Ebu'l Fazl Mahmud Efendi Mescidi, Payzen Yusuf Paşa Türbesi, İbrahim Paşa Hamamı, Azebler Camii ve Hamamı, Kırk Çeşme Suları, Burmalı Mescid Sıbyan Mektebi, Revani Çelebi Camii (Koğacılar Mescidi),

Unkapanı Camii (Süleyman Subaşı-Kara Çelebizade Camiisi) and Saraçhane Karakolu (Saner et al, 2007).

Construction history of İMÇ blocks

- In 1954, Sultanhamam's traffic problems forced the drapers and clothiers to look for employment areas (Kızılkayak, 2009). These craftsmen formed a cooperative to erect a new structure for themselves. This cooperative applied to the municipality to implement its plan (Kızılkayak, 2009).
- The head of the Istanbul Municipality and Governor suggested a drapers' cooperative in Saraçhane, a fire-affected neighbourhood close to Atatürk Boulevard.
- With the Development Law numbered 6785, and the Expropriation Law numbered 6830 by Adnan Menderes, many traditional houses were expropriated in this area.
- Since this area did not have a development plan, the municipality wanted to organize a city planning competition for the project (Özeren, 2008). Two phased planning competitions were organized in 1958 (Tekeli, 2012). In the first phase, 14 projects attended the competition, and the project by the Site Architectural Office (Doğan Tekeli- Sami Sisa- Metin Hepgüler) was chosen as the third one in 1958 (Tekeli, 2012). The second phase was then completed with the participation of the first three projects. In 1960, the Site Architectural Office project was selected as the initial one (Tekeli, 2012), (Figure 3).
- Construction was started with the execution of buildings in the project area. Even though the Saraçhane Fire (1908) destroyed several buildings in the project area, there was still a strong

historical treasury in the 1960s. The construction process destroyed some historical structures and traditional houses (Özeren, 2008). (Figure 3).

- o Hoca Teberrük Mescid (18th century) was demolished, and its foundations were under the blocks. After the Vefa fire, just three walls were rescued.
- o Voynuk Şücaeddin Mosque which was on the land of İMÇ was demolished in 1956.
- o Unkapanı Mill constructed in 1870 was destroyed during the construction of İMÇ.

- In 1967, the first modern shopping mall of the Republic of Turkey, İstanbul Drapers and Yard Goods Bazaar was completed and opened. It had the largest construction area (45000 m²) in this period (Figures 4, 5, and 6).
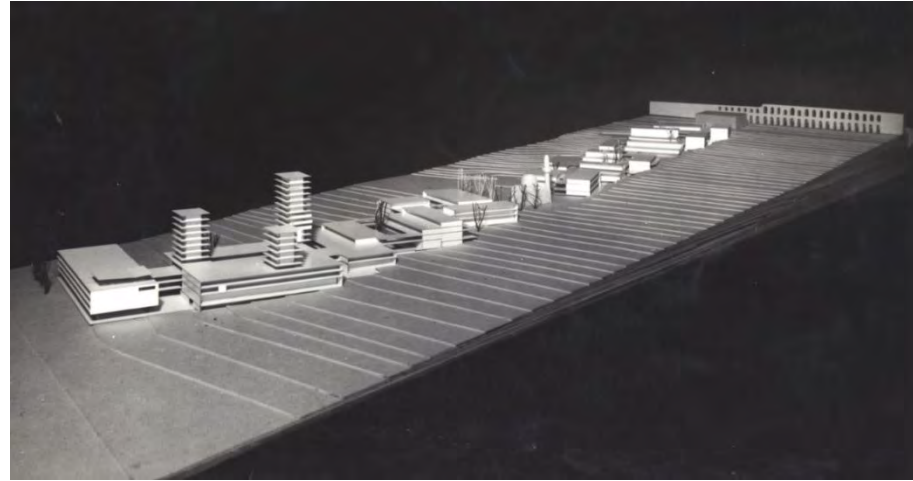

Figure 4. Project of Site Architectural Office (Salt Araştırma, 2022a)

819

Figure 5. Photos from the first years of building (1) and the period of intensive usage (2) (Salt Araştırma, 2022b)
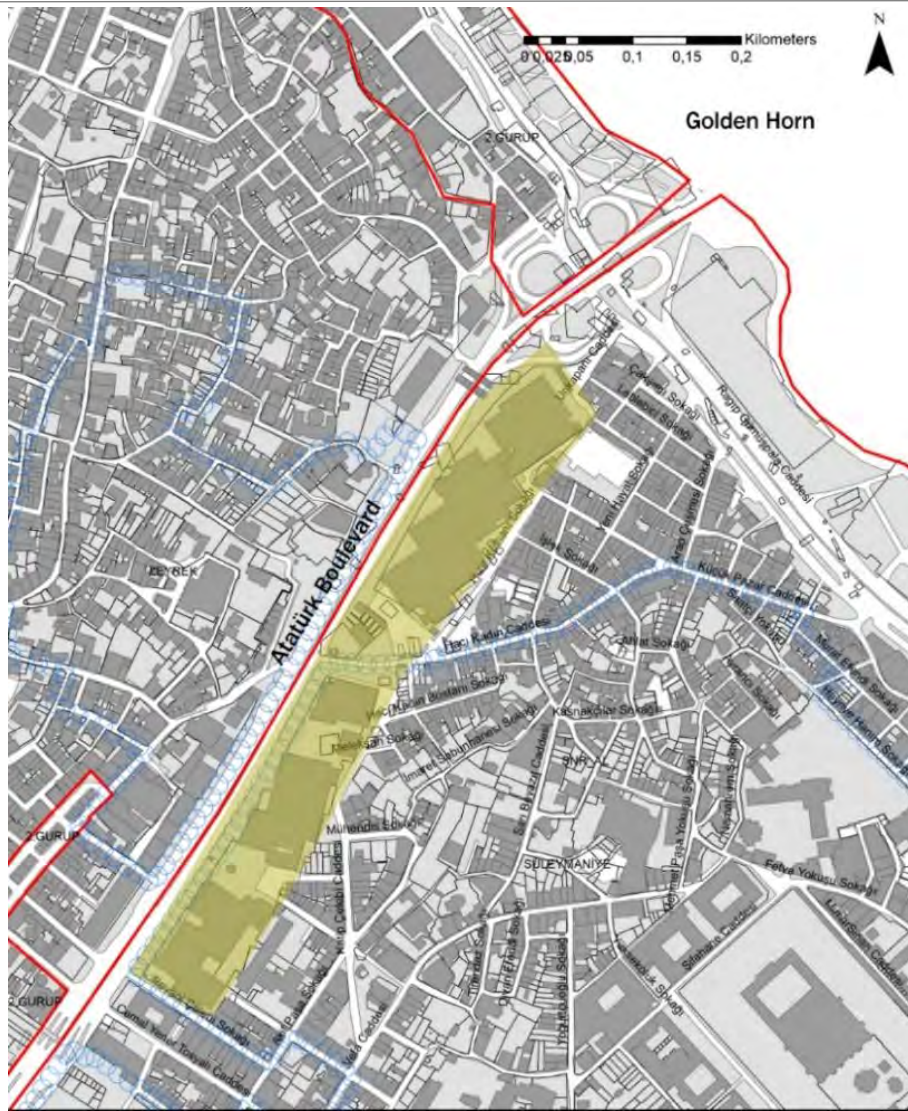
Figure 6. Site plan of İMÇ Blocks

History of Trade Life in İMÇ Blocks

- When the bazaar was over, the traders did not immediately remove their shops from Tahtakale and Sultanhamam. In the 1970s, after the fire of Katırcıoğlu Han in Sultanhamam, the critical firm of velvet (Kadife) moved to İMÇ blocks. The other firms started to move, and the demand for İMÇ blocks increased.

- The idea of İMÇ blocks took on a new meaning in the 1980s. When individuals from Anatolia arrived there with their *saz, bağlama*, İMÇ blocks transformed into a center for music. Many well-known names, such as İbrahim Tatlıses, Küçük Emrah, Mahsun Kırmızıgül, Özcan Deniz, and Mustafa Sandal, gained popularity at this time (Kızılkayak, 2009).

- In the 2000s, due to the development of pirated music, music companies started to be closed. The popularity of İMÇ blocks started to be lost (Kızılkayak, 2009).

- Today, the most popular sector is the maker or seller of curtains (Kızılkayak, 2009).

- 1/5000 master plan and 1/1000 implementation plan approved on 22 September 2005 for the place of İMÇ blocks. The blocks were planned to be demolished by the Municipality within the scope of Conservation of İstanbul Historic Peninsula about law numbered 5336, Presentation by Renovation and Utilization by Revitalization of Deteriorated Immovable Historical and Cultural properties in 2007.

Architectural Characteristics

İMÇ blocks were composed of five blocks; the third block is multi-storied. The original functions of blocks (Figure 2):

1. Block for furnishing, velvet seller
2. Block for sewing machine and readymade seller.
3. Block for offices,
4. Block for industrial machines
5. Block for the music industry
6. Block for the music industry

However, because of the economy, this distribution has permanently altered. Courtyards are located throughout the block, and walkways connect them (Figures 6 and 7). The complex contains roughly 1117 stores. Modern fixtures and components were added to the spaces between the blocks (Figure 7).
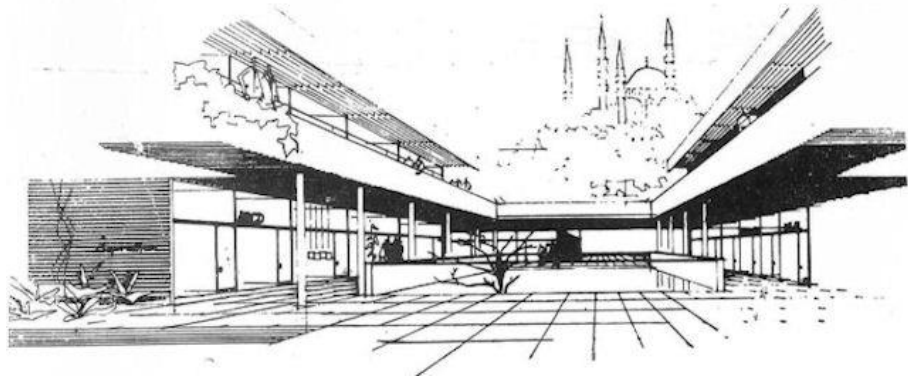
Figure 7. Blocks towards Süleymaniye Mosque (İstanbul Manifaturacilar Çarşisi Proje Müsabakasi, 1958)

Between the blocks, specific historical components are protected. Some graves belong to "Hızır Bey," the first mayor of İstanbul, "Allame Katip Çelebi," an Ottoman scholar, historian, geographer, and author in the 17th -century Ottoman Empire, and "Şair Necati," a poet who contributed to the development of Ottoman poetry at the end of the 16th century, were integrated into the project and preserved in front of the third block. An antique fountain juxtaposed with the wall of the building was preserved. Architectural characteristics of İMÇ blocks according to the designers of the project as in the below (Özeren, 2008; Tekeli, 2012):

- The scale of this bazaar is entirely appropriate for the city's morphology, respecting the heights of the urban fabric and

providing new vistas of the Süleymaniye Mosque (Figures 7 and 8).

- The courtyards and şadırvan in the design were an attempt to maintain the historic bazaar concept.
- The highways were separated from the pedestrian pathways. Continued pathways were built around the internal activity for pedestrians.
- Süleymaniye Külliye was integrated into the İMÇ block's skirts as a column foundation.
- Modest architectural elements were built in the buildings with projections and balconies, as the effect of Süleymeniye's hugeness was provided by the small and modest structures of Külliye (Figure 8).
- The design was inspired by traditional elements such as projections and lattices.
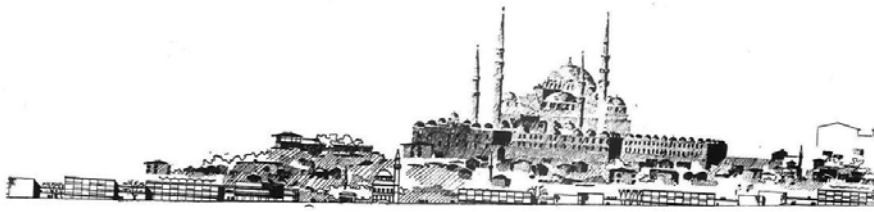
Figure 8. Silhouette of İMÇ blocks and Süleymaniye (İstanbul Manifaturacilar Çarşısı Proje Müsabakası, 1958)

Constructional Characteristics

A module system (5x5 m) was used to construct blocks. A concrete system was preferred in the construction system. Wide spaces and long projections are designed by using a concrete system. Exposed concrete was used on the floors and walls. The filling walls were covered with white travertine. On the first floor, the rear facades of shops were covered with lattice, which was out of the mosaic mortar. There is no variety of materials. Galeries' and courtyards' floor coverings are in situ mosaic; joints were covered with marble and aluminium (İMÇ, 2022).

Artistic Characteristics

One of İMÇ's design ideas is to use modern Turkish plastic art in particular places. Local aspects of modern arts are included in building design. Examples of Turkish plastic art are listed below:

- Ceramic boards of Fureya Koral and Sadi Diren,
- Three mosaic boards of Eren and Bedri Rahmi Eyüboğlu (Figure 9)
- Mosaic board of Nedim Günsür
- Natural-stoned bas-relief of Ali Teoman Germaner,
- Fountain plastic of Yavuz Görey
- Birds Sculpture of Kuzgun Acar (İMÇ, 2022)

Figure 9. Bedri Rahmi Eyüboğlu, Mosaic board

METHOD

The method of the study is composed of the analysis of the site, preparation of the assessment method, and assessment of İMÇ blocks. Previous house settlement organizations dated to 1933 in the construction area of the İMÇ blocks were analyzed and compared with the organization of the İMÇ blocks (1967) through diagrams in terms of spatial and façade organizations. The data about the previous historical settlement was gathered from Pervititch maps (Pervititch, 2012) and the site plan of the historical settlement was drawn. The site plan of the İMÇ blocks is drawn based on the drawings in the competition. The facade characteristics of the historical houses and İMÇ blocks are gathered from historical photos (Tekeli, et al, 1960) The historical photos are rectified, scaled, and then drawn.

Plan organizations are analyzed in terms of mass proportions, the position of courtyards, circulation areas, street, and square relation, and vistas, while façade organizations are compared in terms of mass proportions, the position of architectural elements such as projections, and material usage.

The information from charters and standards was organized as part of the assessment technique to identify the guiding principles of new modern designs in a historic environment. Then the analysis results were evaluated based on the assessment method.

Assessment Method

According to standards and charters, principles for new designs in historic settings were identified from the sources listed in the introduction (Table 1).

823

Principles of New Designs in a Historic Setting

Four headings with subheadings were determined for new designs constructed in a historic setting.

• Respecting the historic urban pattern

New developments should respect the historic pattern of streets and spaces. Urban patterns as defined by

➢ lots and streets,

➢ lot size and scale,

➢ relationship between buildings and green or open spaces that represent the community's social life,

should all be preserved.

• Respecting the formal appearance

➢ The scale of the neighbouring buildings

The scale, hierarchy, rhythm, and massing of the surrounding historical context should be taken into consideration in new designs.

➢ The historic materials and detailing of the new building.

Materials used in historical settlements should complement the existing building stock. It's crucial to use materials that complement historic buildings in terms of color, texture, and design.

• Respecting historic town or surrounding setting

➢ The views and landmarks

Historic urban districts should preserve their landmarks, which play a significant role in the identity of the region or the country.

➢ The historical development

To decide if a historic setting needs to be improved or whether lost components should be restored, it is crucial to understand how a location has changed historically. Before making any plans, the area's history should be thoroughly investigated.

• Making a positive impact on the historic area

➢ Responding to the needs of the area

To create modern buildings in a historic region, density and a variety of applications are crucial; a population increase could damage the area. Therefore, new construction in historic areas can adapt to the quantity, type, and mix of contemporary users without damaging the surrounding environment.

➢ Creating new views, juxtapositions, and textures

New buildings also create new views and juxtapositions which add to the variety and texture of the setting.

➢ Being readily identifiable

New construction should be readily identifiable with its distinctive form, material, color, and construction from the historical settlement.

➢ Being reversible

Changes that decrease cultural value should be reversible and should be done so when the situation allows.

➢ Respecting cultural significance

Where they do not conceal or alter the location's cultural value or remove it from its interpretation and appreciation, new additions might be appropriate.

Modern Heritage Criteria

Ten criteria were determined to identify the modern heritage properties of a new building. The technical, historical, sociocultural, economic, and aesthetic values were encountered for identification (Table 1).

- Types and construction methods of the twentieth century: Technical value
- Significance for the architecture and history of the period: Historical value
- Contribution to technology and political, cultural, economic, and social development: Socio-cultural, economic value
- Land use, external and internal decorative features, interiors, fittings, associated furniture, and artworks: Aesthetic value
- Tangible attributes including historic, social, scientific, or spiritual associations, or creative genius: Intangible value
- Creation of new architectural principles, the reputation of the building or architect, contribution to modernism during and after construction: Canonic value
- How much do architectural and structural characteristics of a modern building affect subsequent buildings: Reference value
- Collective significance and value attributed to a group of modern buildings or sites: Group value
- Buildings or structures that demonstrate new design ideas, innovative construction methods, or experimental building materials: Uniqueness value
- The benefits of using modern structures, both practically and functionally: Use value

825

Table 1. Assessment Table

		Assessment Table		The Case
Principles of new designs in a historic environment	Respecting the historic urban pattern	Lots and street relation		
		Open spaces and building relation		
		Lot sizes and scale		
	Respecting the formal appearance	The scale of the neighboring buildings		
		The historic materials and detailing of the new building.		
	Respecting historic town or surrounding setting	The views and landmarks		
		The historical development		
	Making a positive impact on the historic area	Responding to the needs of the area		
		Creating new views, juxtapositions, and textures		
	Being readily identifiable			
	Being reversible			
	Respecting cultural significance			
Qualified modern building properties	Technical value			
	Documentary Value			
	Land use properties			
	Aesthetic and artistic value			
	Historical value			
	Socio and economic value			
	Intangible value			
	Canonic value			
	Reference value			
	Uniqueness value			
	Group value			
	Use value			

ANALYSIS AND ASSESSMENT RESULTS

Assessment of İMÇ Blocks in terms of Harmony with the Historic Environment

- Respecting the historic urban pattern

Pervititch maps illustrate narrow roadways separating the small, irregularly formed plots before the construction of İMÇ blocks. (Pervititch, 2012). There are different-sized and formed courtyards surrounded by houses. Based on the shape of the plots, the form of the courtyards changes. Most of them are enclosed and are divided into small gardens belonging to the houses. Due to the slope, there are fewer longitudinal connections between houses in comparison to transverse ones with Gazi Mustafa Kemal Paşa Boulevard. Between the houses, the Sefa Hatun Mosque creates a large extensive square (Figure 10).
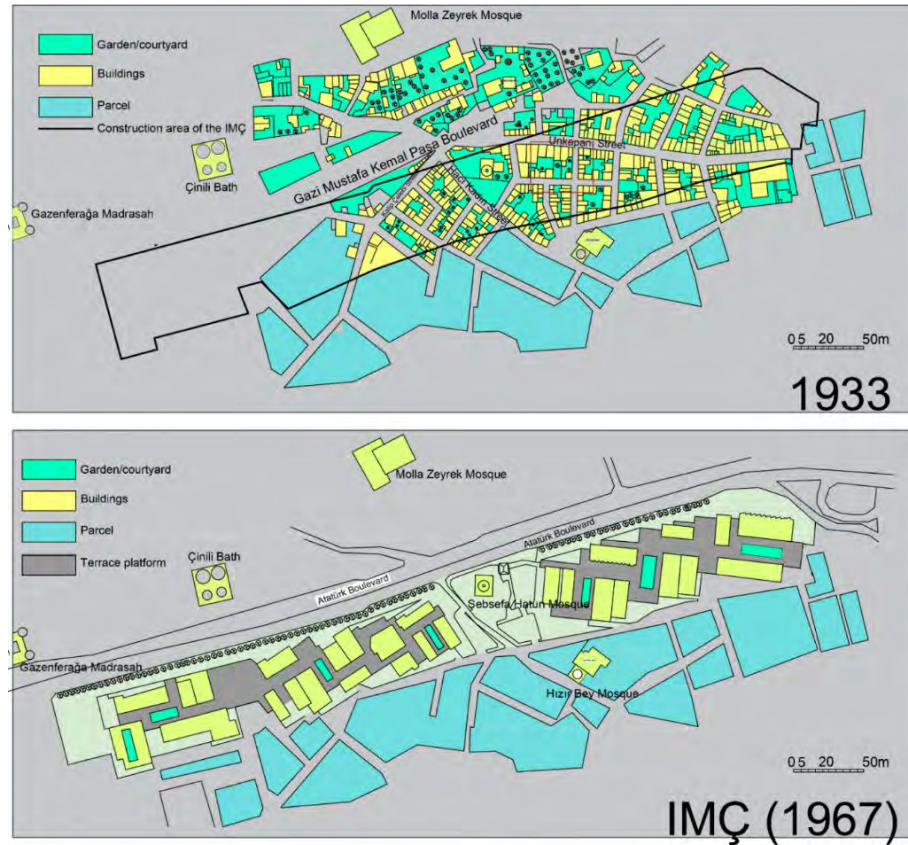
Figure 10. Historical house settlements in the construction area of "İMÇ" (1933) (Revised from Pervititch, 2012) and then characteristics of İMÇ blocks (1967) (Revised from Tekeli, et al, 1960)

Although the layout of the İMÇ blocks is not similar to the settlement of historical houses in terms of scale, they show similarities in terms of courtyards and street connections. Two open and six closed courtyards are firmly open to the outside and connect the settlement to the boulevard. İMÇ blocks are used to establish transverse connections between the boulevard and the houses, and the terrace platform is also used to improve longitudinal connections like in earlier settlements (İMÇ 1967—the blue line presented longitudinal connections). Thus, The

blocks have improved transverse and longitudinal access to the area (Figure 11). Şebsefa Hatun Mosque is now visible as a modest structure between blocks, in contrast to its square appearance in the earlier settlement.
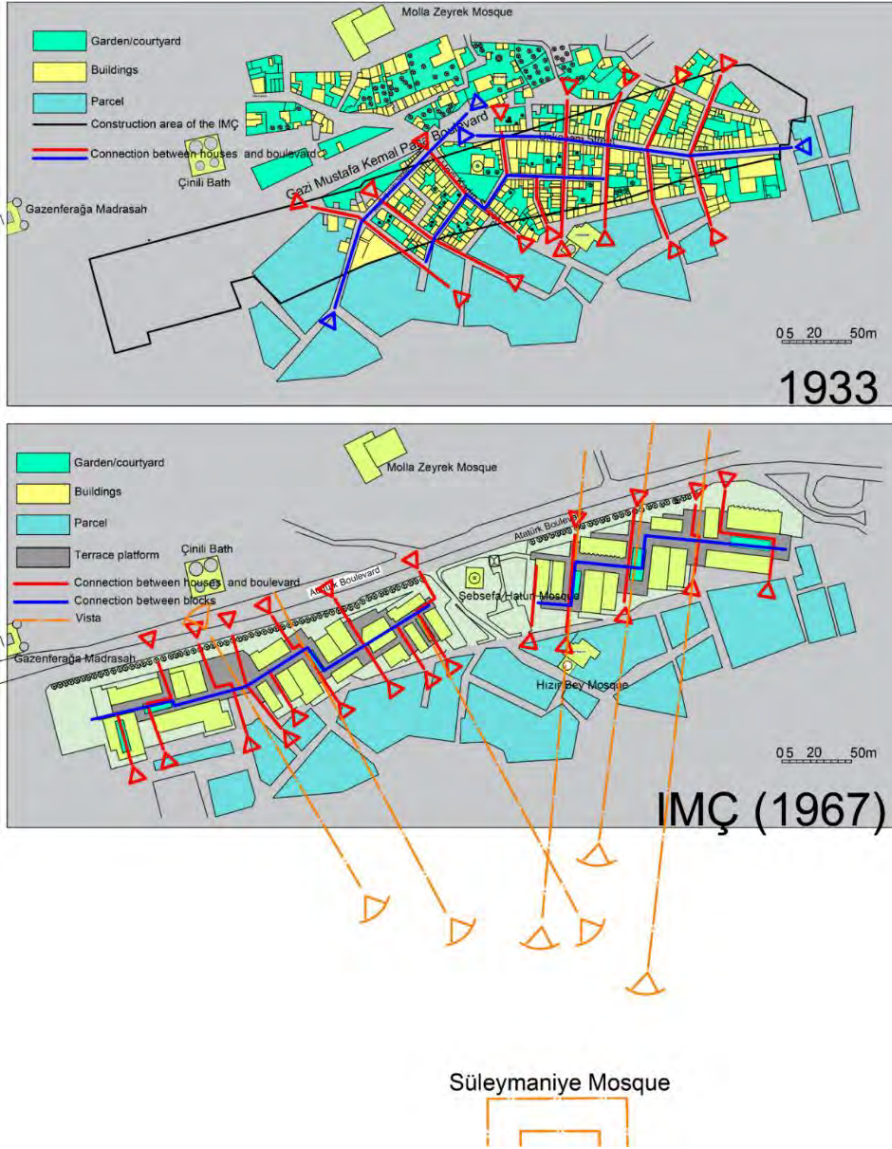
Figure 11. Transverse and longitudinal access between the historical houses (1933) and İMÇ blocks (1967), and vistas

The sizes of the houses' and İMÇ blocks' masses are superimposed on a map. The size of the İMÇ blocks is much greater than that of the historical houses. There were houses in the area about a third of the size of the blocks. Courtyards between the İMÇ blocks are the same size as those between houses (Figure 12).

- Respecting the formal appearance

The scale of İMÇ is highly appropriate to the city's morphology, respecting the heights of the urban fabric. Restricted elements were planned in the buildings with projections and balconies, much as the sense of the vastness of Süleymaniye was supplied by the small and modest structures of Külliye.

Figure 12. Proportions of the historical houses (1933) and İMÇ blocks (1967)

Figure 13. Façade characteristics and architectural elements in historical houses and İMÇ blocks (Redrawn from photos Salt Araştırma, 2022b)

Despite the mass proportions of İMÇ, the façade organization is designed for integration with the earlier houses using architectural details. The

architectural components were scaled to resemble earlier houses using balconies, projections, and terraces. There were few materials visible within the structure (Figure 13).
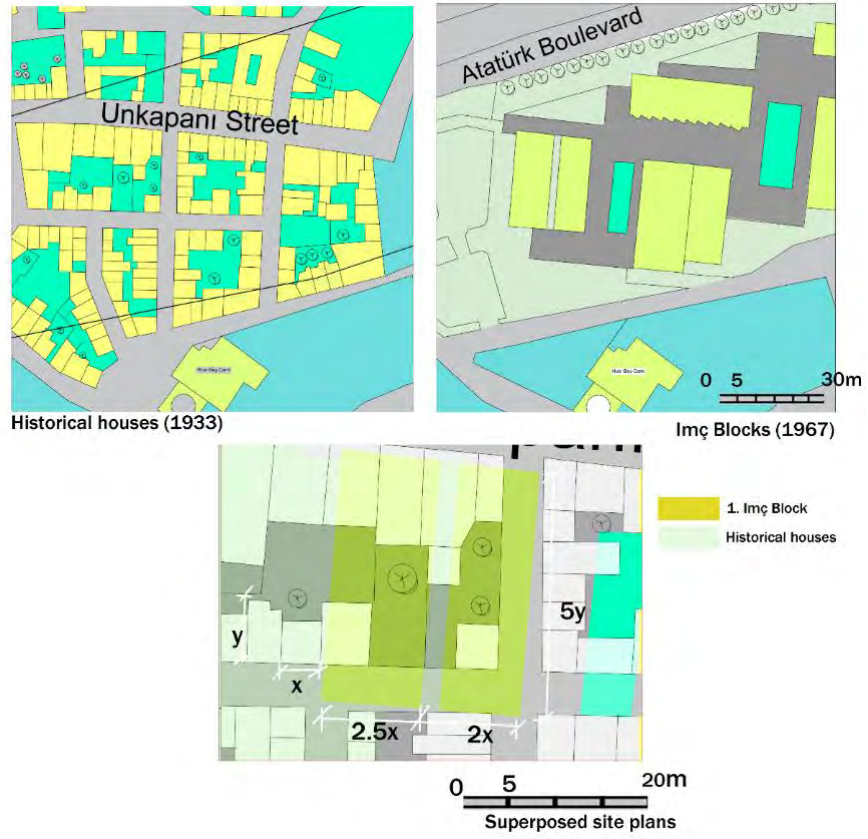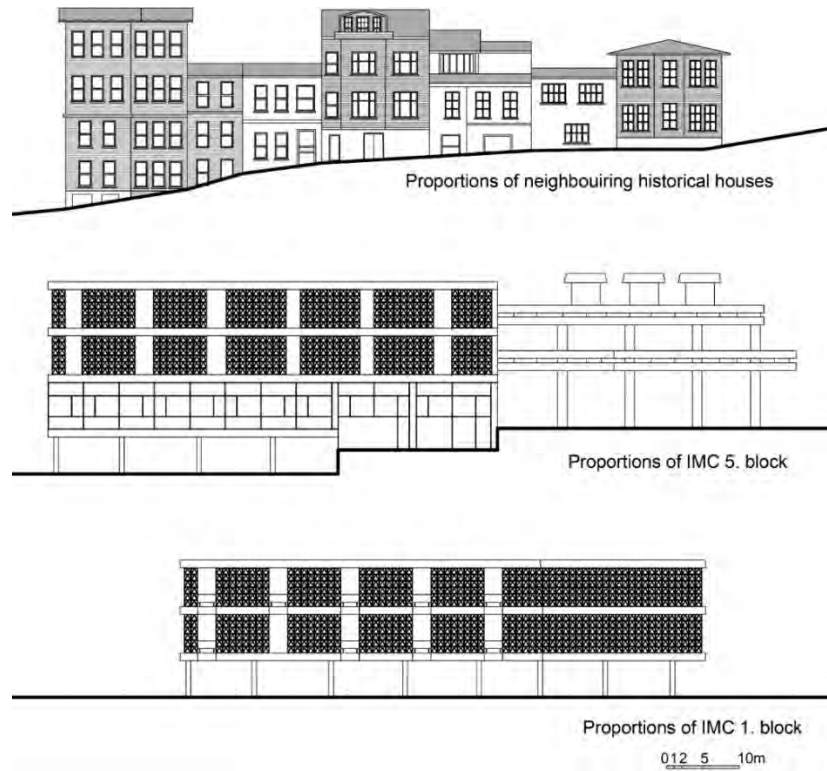
- Respecting historic town or surrounding setting

In contrast to the historic houses, the blocks are not positioned parallel to the boulevard; instead, they zigzag up the boulevard by creating openings to the Suleymaniye Mosque. The platforms between the blocks provide views expanding toward the Süleymaniye Mosque (Figure 13).

Each block has a square on the ground floor, which creates a connection between the street and the neighborhood. Courtyards offer a connection to the outside and connect the houses to the street.

Due to the architectural requirements, the historical development of the area could not be sustained.

- Making a positive impact on the area

The density of the surrounding area affected the design of the blocks. For pedestrians, the continuous ways were designed. The pedestrian ways were left from the highways. Courtyards were designed to gather people not to damage the surrounding historical area. These courtyards and pedestrian ways create new views inside the building.

- Being readily identifiable

The İMÇ blocks are identifiable with their certain forms and modern lines and material usage from the surrounding historical buildings.

- Being reversible

The İMÇ blocks are not reversible, they should not be planned to be changed when circumstances permit so this reduces the cultural significance of the historic site.

- Respecting cultural significance

The inputs of the traditional bazaars such as projection, *şadırvan*, and courtyard used in the design of İMÇ blocks are the representation of belonging to the culture. The art in the courtyards of the bazaar gave it the characteristic of identity through belonging to culture (Table 2).

Assessment of İMÇ Blocks in terms of Modern Heritage Criteria

- Technical value

The forms and structures express the technological development of their time in the use of reinforced concrete with the spirit of traditional elements.

- Land use properties

The blocks use the advantage of the topography, and they can be reached on all floors without stairs. Thus, all floors can be entered and circulated easily. The pedestrian ways were left from the highways. For pedestrians, continued ways were designed around the active interiors.

- Aesthetic value

İMÇ blocks reflect Modernist tendencies by using a modular system and modern interiors, fittings, and arts. It creates an open and dynamic space,

with modern Turkish plastic art. It has also traced traditional features such as lattice, projection, *şadırvan*, and courtyard.

- Historical value

The complex is historically symbolic of the Turkish Republic as the first of its kind. The first modern shopping mall in Turkey was constructed. İMÇ promotes modern architecture and advanced urban planning in Turkey, with its architecture representing its period. It identified its function by itself. The birth of pop and arabesque music culture in İMÇ blocks formed a crucial period in Turkey in the 1980s.

- Socio and economic value

Each block owned its identity in time; the building provided a great character to its place. An intimate relationship between the traders was created with the help of the design of blocks (galleries, open spaces). İMÇ blocks have been a significant contributor and witness to the economic situation of Turkey in terms of the music and textile sector to the economy and tourism sector with its plastic arts.

The usage of concrete, fragmented designs, and local artistic features of the blocks are specific features of the Turkish modernization period in the 1960s. Blocks have also reflected local modernization features.

- Intangible value

The İMÇ blocks have a legend that the people who came from Anatolia with *bağlama* and *saz* became popular in a short time.

- Canonic value

The İMÇ blocks contributed to modernism with their design, form, construction technique, and material usage.

- Reference value

Site plan organization composed of blocks and courtyards, the form of the blocks, blocks' concrete construction systems, modern architectural elements lattices and balconies, and arts affect subsequent structures serve as a model for more recent constructions.

- Use value

The blocks can provide spaces for commercial community activities. Shops enhance their sense of identity. It identified its function by itself. The birth of pop and arabesque music culture in İMÇ blocks formed a crucial period in Turkey (Table 2).

831

832

Table 2. Assessment of İMÇ blocks

	İMÇ Blocks		
Principles of new designs in a historic environment	Respecting the historic urban pattern	Lots and street relation	√
		Open spaces and building relation	√
		Lot sizes and scale	×
	Respecting the formal appearance	The scale of the neighboring buildings	√
		The historic materials and detailing of the new building.	
	Respecting historic town or surrounding setting	The views and landmarks	√
		The historical development	×
	Making a positive impact on the historic area	Responding to the needs of the area	√
		Creating new views, juxtapositions, and textures	√
	Being readily identifiable		√
	Being reversible		×
	Respecting cultural significance		√
Qualified modern building properties	Technical value		√
	Documentary Value		√
	Land use properties		√
	Aesthetic and artistic value		√
	Historical value		√
	Socio and economic value		√
	Intangible value		√
	Canonic value		√
	Reference value		√
	Uniqueness value		×
	Group value		×
	Use value		√

CONCLUSION

The assessment shows that the İMÇ blocks have modern heritage values and effectively respect the historical settlement. Although it does not follow the historical pattern, it is harmonious with the old materials and detailing and respects the façade scale of the nearby buildings, views, and monuments. Fortunately, the building respects the historical region considering the conditions and creates a structure that combines modernist trends with conventional concepts. It provides perspectives, contrasts, textures, and aesthetic, historical, sociocultural, and intangible values.

When the previous texture of the area is examined, it has been determined that it consists of small-scale houses located around the inner courtyards. The connection between the roads and the boulevard is continuous, but the longitudinal connection between the houses is limited due to the slope. The orientation of the İMÇ blocks, the inner courtyards between blocks, and the opening of the courtyards to Süleymaniye have positively affected the character of the area. The transverse and longitudinal connections designed between the blocks provide continuity in the settlement. In terms of façade features, although the masses are large, the heights of the masses are in harmony with the historical housing pattern. Thanks to the architectural elements, the size of the mass was minimized, and balance was achieved with features such as windows and projections in the houses. İMÇ blocks combine art, industry, and trade in the same space. Assessment results suggest that the buildings to be built in historical areas should be examined in detail in terms of vista, horizontal and vertical street connections, space organizations, and sizes. By comparing the current and previous settlements of the area, determining the interventions and assessment of these interventions with charters are essential in terms of conservation decisions.

This assessment method is crucial since it can provide an evaluation of a modern building in a historical setting before any intervention is made. Thus, the new modern buildings could be designed harmonies with the historic areas. The results gained from the assessment also strengthen the data set gained from the analytical documentation phase.

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834

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Resume

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837

Ostrakinda: A Game-Based Learning Toolkit for Ancient Mediterranean Cities

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Abstract

The study develops the 'Ostrakinda' toolkit for teaching morphologies of ancient Mediterranean cities. The methodology consists of a triple structure involving design, play, and analysis phases. In the design phase, the level of interest and actual demands of students regarding game-based learning (GBL) and ancient cities were explored through pre-experiments. The play phase involved experimental studies conducted in courses and workshops, where both physical and digital toolkits were tested by a total of 331 students. The analysis phase aimed to evaluate the impact of the game by systematically addressing five research questions.

The results of the paired t-test confirm a significant difference in scores before and after playing the game, thus validating the effectiveness of the proposed strategy. Additionally, Chi-square (X^2) tests revealed significant relationships between the form of play and the level of abstraction in the game outputs. Individual and group experiences during gameplay were associated with various interactions, and group experiences particularly fostered competitive and collaborative learning. The extensive analysis using the GBL Design Scale, comprising ten critical factors (GBL-Fn), showed that the challenge factor (F8) had the weakest values, while fantasy (F5) and narrative (F6) had the highest values in the correlation matrix.

Overall, the study contributes methodologically and contextually to the existing literature, offering valuable findings for the future development of similar strategies in architectural education. However, it is important to acknowledge the limitations of this interdisciplinary study, particularly with regards to technical, cognitive, and archaeological aspects. Nevertheless, the clear and effective structure of the game holds promise as a valuable tool for learning.

839

GBL IN DESIGN EDUCATION

Since the early 1950s, there has been a growing interest in the application of game-based learning (GBL) strategies in the field of architectural and urban design education. Educators took initial steps in using new urban games to understand urban complexities, as indicated by a notable report of Berkeley, 1968. A comprehensive bibliography titled 'Gaming Techniques for City Planning' was published in 1971, encompassing 95 books, articles, and 24 centers dedicated to exploring gaming techniques in city planning (Thornton, 1971). A more recent analysis of the Scopus database reveals that a significant majority of the 9,429 articles retrieved using the search query 'game-based AND learning' were published from 2007 onwards, with 36% originating from 2020 and beyond (search: June 23, 2023). These statistics provide clear evidence of the scholarly engagement in the field of GBL.

The literature review covers operational (Summers, 1979), serious (Abt, 1987), simulation (Feldt, 1995), and instructional (Kapp, 2012) games. Prior to the emergence of field-specific journals like the International Journal of Game-Based Learning (2011), volume 33 of the Journal of Architectural Education (1979) was devoted 'gaming' theme. This volume featured essential studies focusing on the GBL framework, design games, educational games designed with students, and games to be used in practice. Examining the pedagogical aspects and the effectiveness of GBL in design education are crucial. Hence, the following questions arise: What are the positive pedagogic impacts of game-based learning techniques on architectural students? Why is gaming successful as a teaching tool in design education? Games enhance understanding of complex issues, promote involvement in collaborative learning, increase students' attention in competitive or collaborative manner, reveal the consequences of immediate decisions, enable self-judgment, foster creativity through (co-)ideation, facilitate immersion with role playing, encourage broader participation, and facilitate the user-centered design process for cross-disciplinary groups (Summers, 1979; Berkeley, 1968; Kalay & Jeong, 2003; Brandt & Messeter, 2004; Vaajakallio & Mattelmäki, 2014; Dodig & Groat, 2019).

In North American and Western European universities, both modular and holistic games have been utilized to support urban planning (Thornton, 1971) and architectural design (Summers, 1979) studios. Thornton (1971) lists 26 games covering topics such as pollution, neighbourhood management, urban dynamics, and transportation. Alan Feldt, in his work 'Thirty-Five Years in Gaming,' traces the evolution of urban simulation/gaming and highlights his own contribution of 12 games, including the widely recognized CLUG (Feldt, 1995). In his work titled 'Operational Games in Architecture and Design' published in 1979, Summers presents six categories of architectural gaming, classified into two gaming styles: user-oriented games (focused on housing issues and facilities planning) and pedagogic games (covering construction,

professional practice, problem-solving, and design issues) (Summers, 1979). There is a close relationship and simultaneous use of gaming in both architecture and urban planning. The origins of gaming in these fields can be traced back to military and business games, specifically gridded board games (Bonta, 1979; Keslacy, 2015).

How to design new GBL strategies into the courses to address various complex issues? It requires a deep understanding of the subject matter, learning objectives, and the actual needs of students. In this regard, elaboration of the pioneering approaches is important to gaining insights and positioning the proposed toolkit in emergent GBL practices (Table 1).

Table 1. GBL practices in architectural and urban design

Game (Acronym)	Year	Developer	Institution/Lab.	Description	References
Planning Operational Gaming Experiment (POGE)	1959	Francis H. Hendricks	City planning course at Cornell University	A zero-sum planning game dealing with strategies of two opponents to change zoning regulations in a previously zoned city.	(Hendricks, 1960; Feldt, 1966)
Michigan Experimental Teaching and Research Operation (METROPOLIS)	1960-64	Richard D. Duke	Michigan State University (Environmental Simulation Lab)	A non-zero-sum planning game to reduce the gap between plan-makers and decision-makers showing changes in land use affacted by decisions of the game actors.	(Duke, 1964; Berkeley, 1968)
World Peace Game	1961	R. Buckminster Fuller	Southern Illinos University	A worldwide game that has no losers, to facilitate a comprehensive design science approach for the global problems.	(Fuller, 1969)
Cornell/Community Land Use Game (CLUG)	1964-65	Allen G. Feldt	Urban ecology and city planning Cornell University	A planning board game to experience some of the more basic economic forces effecting land use decisions of rapidly growing industial city	(Feldt, 1966; Berkeley, 1968; Feldt, 1995)
Simpolis	1967	Clark C. Abt	Abt Associates	An agitation game stimulating the participation in planning process major urban issues.	(Abt, 1987; Berkeley, 1968)
Instructional Housing and Building Simulation (INHABS)	1971	Cedric W. Green	Gloucestershire College of Art and Design	A neighbourhood-scale housing game to develop awareness of the effect of roles and their interaction on the total design process.	(Cedric, 1979; Summers, 1979)
ARCHITEST	1975	Luis H. Summers	Penn State University	A housing game to externalize the process of architectural evaluation and understand the rationale behind design decisions.	(Summers, 1979)
Heating and Air-conditioning (HAC)	mid-1970s	Juan P. Bonta	Ball State University	A boardgame to minimize total expenditures in heating and air-conditioning a home.	(Bonta, 1979)
KEEPS	1978	Henry Sanoff	School of Design at North Carolina State University	An urban participatory game to provide the group concensus desicions on preserving the environmental qualities in districts and towns.	(Sanoff, 1979)
MEDICAL	1979	Luis H. Summers	Pennsylvania State University	A facilities planning game consists of a kit to reach an agreement on of ptotoypical layouts	(Summers, 1979)
Cardboard City	1980	Marc Treib	University of California, Berkeley	A prototyping game that one analog builds upon another with full-size construction	(Treib, 1982)
River City	early-2000s	Chris Dede	Harward University	A multi-user game to learn through the virtually depicted industrial 19th century cities	(Clarce & Dede, 2009)
SpaceFighter	2007	Winy Mass	Delft School of Design & Berlage Institute	An urban simulation game to explore the challanges of the evolutionary city.	(Maas et. al., 2007)
ScarCity	2007	Axel Becerra Santacruz	School of Architecture at Sheffield	A boardgame to understand the design process of scarcity.	(Santacruz, 2019)
Dubinda	2010	Jordi Gascón Gutiérrez	Foro de Turismo Responsable	A game aims to reveal some of risks that the emergence of tourism activity with transnational capital for peasant societies.	(Gutiérrez, 2018)
Distributed Urban Game: Bloom	2012	Alisa Andrasek & José Sanchez	Bartlett School of Architecture	An interactive urban game to engages people in social play and collaborate in prototyping, generative design.	(Andrasek & Sanchez, 2012)
SuperBarrio	2017	MaCT students and experts	IAAC Master in City & Technology (MaCT)	An open-source virtual game to facilitate the citizen engagement to the neighbourhood design as one of the desicion maker.	(Markopoulou, 2020)
Polis PowerPlays (PPP)	2018	89 Friends	University of Queensland	An urban planning game aimed at teaching students and professionals the nuances of complex interactions and negotiations	(Pojani & Rocco, 2020)
EquiCity Project GoDesign	2019	Genesis Lab	TU Delft	A modular generative design game for mass-customization and optimization in participatory city planning.	(Bai et. al., 2020)
Townscaper	2020	Oskar Stålberg	Steam	A video game inspired by the Scandinavian cities to create their own town	(Harrouk, 2020)

Several popular games have been extensively investigated within the urban context, including Monopoly (1900s), a strategic board game derived from The Landlord's Game; SimCity (1980s), an open-ended simulation game; Minecraft (2000s), a massively multiplayer online game; and Pokémon GO (2016), an augmented reality location-based mobile game. Notably, UN-Habitat published a manual on using Minecraft as a community participation tool in urban design projects (Westerberg & Rana, 2016). TechCrunch reported an average daily gameplay time of 33 minutes and an astonishing 21 million active users for Pokémon GO (Perez, 2016). Additionally, the EU-funded Public Play Space (PPS) project (2019-21), developed by a multidisciplinary consortium, cataloged 30 public space games focusing on environmental awareness, collective design, storytelling, learning, and decision-making (Farinea et al., 2021). Furthermore, the EU project titled 'Play the City' has incorporated 42 city games in 20 cities since 2010, utilizing community engagement as an integral problem-solving and collaborative decision-making tool (Tan, 2017). However, these popular games merely scratch the surface of the extensive body of literature encompassing a wide range of (un)published games. Some played in the laboratory by students, some played in the street by citizens (Berkeley, 1968).

Tóth (2015) conducted an analysis of 19 urban planning games, considering various criteria such as purpose, field of application, genre, technology, target group, location, and empirical results regarding their effectiveness. In our research, we examined the practices of Game-Based Learning (GBL) by considering a range of factors, including game types, gaming techniques, approaches, themes, contexts, number of players and required time, spatial scale, gains and outcomes, interfaces, and mediums. Understanding these essential components is crucial for designing effective GBL strategies.

- Game types: Roger Caillois defines four main types of play: competition (agon), chance (alea), vertigo (ilinx), and simulation (mimicry). These types can be combined in six theoretically possible dualities. Caillois also describes an evolution within each type, from paidia (active, spontaneous play) to ludus (structured, rule-based play) (Caillois, 1961). In our study, the examples provided in Table 1 primarily align with the type of mimicry, emphasizing role-playing and narrative elements: POGE, involving planners and developers; METROPOLIS, involving politicians, planners, administrators, and land developers; and INHABS, involving consumers, bankers, planners, press, builders, architects, associations, and local authorities. Additionally, there are examples that correspond to the agon type (POGE), alea type (Cardboard City), and ilinx type (River City).

- Gaming models: Schran and Kumpf (1972) classified gaming models in the field of environmental planning into three main groups based on the level of abstraction and formalization of reality: free, hybrid, and rigid games. These models exhibit different characteristics and approaches. In our study, we can observe examples that represent each

841

of these categories. For instance, CLUG represents a predetermined set of factors, Townscaper and GoDesign utilize generative rules, POGE incorporates zones, and HAC involves codes of calculation. These examples reflect the more structured and rule-based nature of ludus games, in contrast to the more open-ended and flexible characteristics of free games (e.g., Simpolis) or the combination of both in hybrid games (e.g., METRO).

• Techniques and forms of integration: Summers (1979) defines two types of gaming techniques: holistic and nested. While many initial examples utilized holistic systems (such as Simpolis and Cardboard City), complex or sequential processes are also simulated by nested systems (such as ARCHITEST), which consist of diverse subsystems. GBL activities can also be categorized as immersive (involving an entire lecture or course) and modular (as independent activities), based on their form of integration into the class (Hartt et al., 2020). Modular activities are more commonly observed in the examples, as they are easier to implement. However, Cardboard Cities represents an immersive game played by students in the Environmental Design 3 studio at the University of California.

• Approaches: There are different approaches in games, including global and environmental approaches (e.g., World Peace Game), social and political approaches (e.g., METROPOLIS, KEEPS), economic approaches (e.g., CLUG, INHABS), computational approaches (e.g., HAC, ARCHITEST), and participatory approaches (e.g., Simpolis, SuperBarrio). Additionally, there is integration or synthesis between METRO and CLUG, leveraging their complementary structures in terms of social, economic, and political aspects.

• Themes & Contexts: Summers (1979) identified housing as the most gamed theme in architecture. In addition to housing, various themes were adressed, including global problems, major urban issues, environmental preservation, land use, transportation, scarcity, crisis, over-tourism, and facilities planning in relation to the subject matter and learning objectives. Developers involved in game creation encompass architects, urban planners, philosophers, sociologists, researchers, educational researchers, and game developers. The games draw inspiration from diverse contexts, such as Mexico (Scarcity), American cities (River City), Mediterranean coastal tourism destinations (Dubinda), Scottish villages (INHABS), Barcelona super blocks (Super Barrio), and Scandinavian cities (TownScaper).

• Spatial scale: The games examined, including World Peace Game (operating at a global scale), CLUG (utilizing an urban gridded board at a scale of 1:10,000 divided into 100 squares), INHABS (at a scale of 1:250), ARCHITEST (employing a kitchen modular scale), and Cardboard City (at a scale of 1:2 with full-size construction), exhibit varying spatial scales.

• Gains & Outcomes: Despite the competition generally revolving around making money, different types of players' gain (or loss), such as zero-sum (as observed in POGE) and non-zero-sum (as observed in

METROPOLIS). Additionally, games like World Peace Game and KEEPS are designed without losers, promoting a cooperative approach. Gerald Gutenschwager (1979) emphasized the game's role in education, highlighting its ability to simulate reality, foster strategic thinking, and enhance social awareness through the calculation of decision outcomes and actions. In GBL studies, Qian and Clark (2016) identify critical thinking, collaboration, creativity, and communication as targeted 21st-century skills to be developed as learning outcomes. The games draw attention to fundamental skills that support cooperation, heuristic learning, and creativity, such as matching, grouping, analyzing, designing processes, making decisions, problem-solving, and formulating strategies.

• Interfaces & mediums: Examples of game mediums include the utilization of urban space (e.g., PPS, Bloom) and the representation of city actors within the play space (e.g., POGE). The choice of interfaces plays a significant role in facilitating this representation. In earlier works, physical interfaces such as tangible, analog, crafting, grid planes, tokens, and board games were prominent. However, with the advent of the 20th century, digital interfaces such as video games, simulation-based platforms, mobile applications, augmented reality (AR), and virtual reality (VR) have become increasingly prevalent. Many games also employ both physical (e.g., Cardboard City) and virtual (e.g., Archville) versions, either for comparison or to enhance usability.

By exploring the described factors within the framework of GBL (Figure 1), we can gain valuable insights into the diverse nature of play. This understanding enables us to recognize the unique experiences and opportunities for learning, engagement, and the development of effective strategies that different types of games offer.
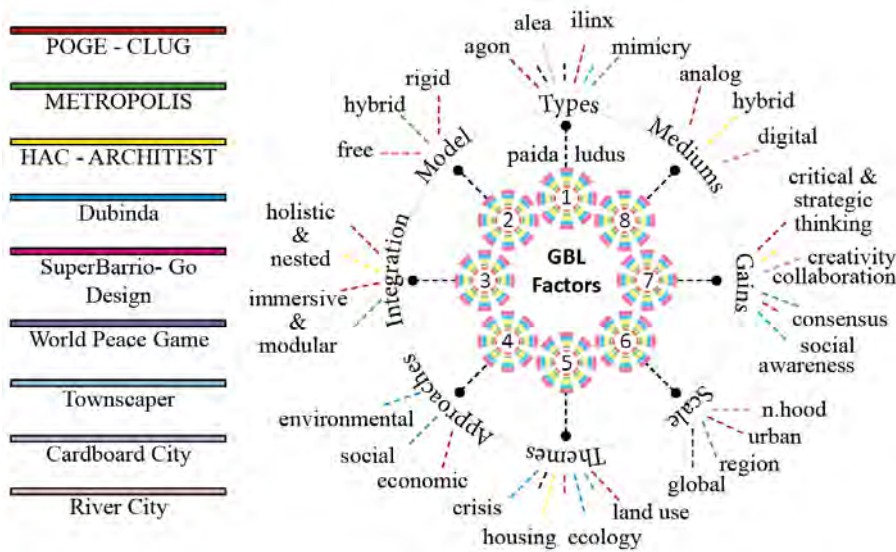
843

Figure 1. Framing GBL components according to the planning and design games.

The factors mentioned can be further expanded by considering sub-attributes such as the number of players and sessions. For example, HAC

involves 20 players and requires 2/3-hour sessions (Bonta, 1979), while PPP accommodates 20 to 60 players. Dubinda is designed for 4 to 16 players and requires a 3-hour session, and Cardboard Cities involves 75 students over several weeks. Additionally, there are massively multiplayer online games like Super Barrio, Space Fighter, and River City that create social gaming environments. These components of GBL practices intersect in the complexity of the city and the involvement of different actors in a fantasy setting.

Ostrakinda, a children's game played with seashells or broken amphora pieces in ancient Greece, has served as the inspiration for a dichotomic concept that represents the dual nature of Mediterranean cities, encompassing both the ancient and modern aspects (Baran, 1974). The objective of this study is to develop an open-ended GBL toolkit called Ostrakinda, which is specifically designed to enhance the teaching of ancient Mediterranean cities and to introduce playful strategy into regular architectural education classes. To achieve this aim, our research has delved into the exploration of tangible-digital interfaces, individual and collaborative experiences, and analysis methods supported by artificial intelligence within the game. The paper's structure is as follows:

• The next section presents an overview of the methodological workflow utilized in designing, implementing, and analyzing the Ostrakinda toolkit. It provides a detailed description of the toolkit, including its conceptual background, gridded frame, (non)digital interfaces, and the complementary structure of its components.

• Following that, five research questions are examined through the analysis of gameplay interactions, output, and participants' feedback to clarify how interactions occur in the play.

• Subsequently, the paper discusses the results of experimental studies conducted in different periods and settings, offering a comprehensive analysis of the findings.

• Finally, the paper concludes by highlighting the potentials and limitations of the Ostrakinda toolkit, accompanied by recommendations for future studies.

METHODOLOGY

The research methodology encompasses three distinct phases: design, play, and analysis. During the design phase (1), researchers develop physical or digital toolkits aligned with the research objectives. These toolkits are subsequently assessed within workshop and (online) classroom settings during the play phase (2). Finally, the analysis phase (3) involves measuring and evaluating the individual or collaborative gameplay experiences. The resulting findings generate feedback that informs the modification of the game within the action circle. Throughout these phases, diverse methods and tools are employed, as illustrated in Figure 2.
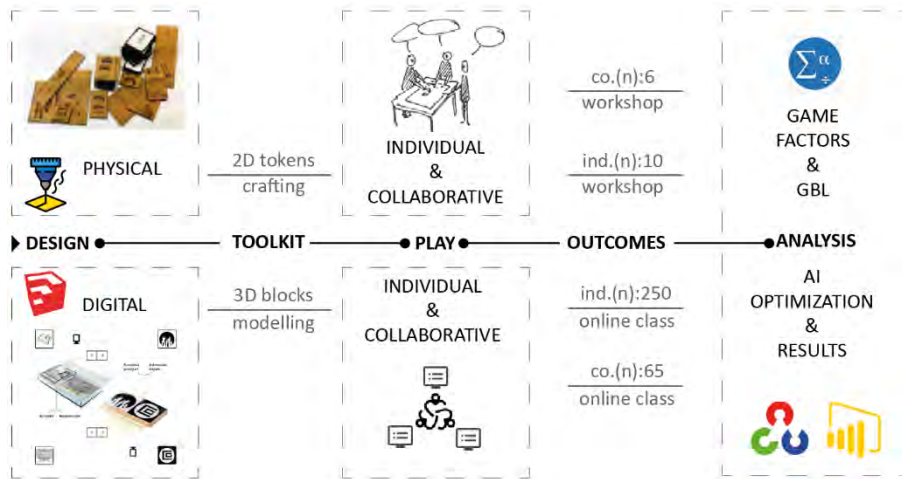
Design of Toolkit

Phase 1 focuses on the ideation of the game, considering its relations (tasks and rules), components (cards and grids), and representations (pictograms and diagrams). The primary goal of Ostrakinda is to provide a practical and interactive way of teaching concepts, functions, and values related to ancient cities. To achieve this, it is essential to simplify and abstract the essential elements and morphologies of the city. In the initial tests, the city of Priene, known for its grid plan in the Mediterranean geography, was chosen as the model. Several factors influenced the selection of this city, which can be highlighted.

The urban development in ancient Hellenic cities is divided into natural and Hippodamian systems (Doxiadis, 1964). Aristotle discusses Hippodamos' grid-based urban planning system, which categorized cities into three zones: sacred, public, and private according to Doxiadis (1964), small-scale cities, which constitute the majority, typically have an average size of approximately 180 hectares. Wycherley (1962) characterizes the city of Priene as a "model Greek city" due to its small-scale nature. Similarly, Gates (2015) emphasizes that the modest characteristics of Priene exemplify the ancient Greek city in a generic and distinct manner, in contrast to more affluent and extensively reconstructed centers like Athens. Cities like Priene, Olynthus, and Miletus feature the essential elements of the Hellenic city, with a grid (checkerboard) urban pattern of simple, open, and practical streets intersecting at right angles. Priene was selected as the foundational model for initial tests due to its clear urban elements, well-preserved nature, and grid plan. Game boards were created based on the city grids using abstraction (Figure 3).
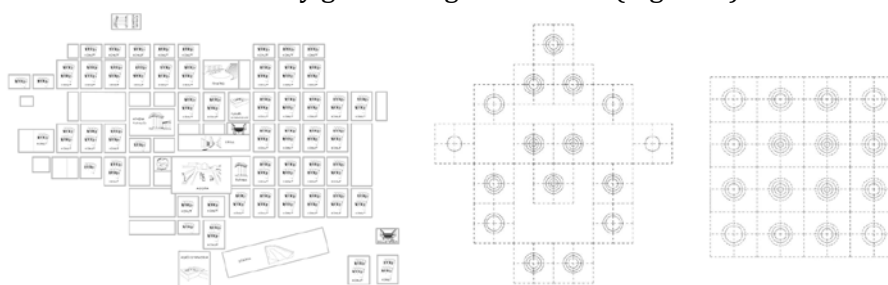
To enhance the effectiveness of the board, it is essential to create both 2D and 3D representations of urban elements. These representations can be crafted manually or digitally modeled. A tangible interface can be utilized, consisting of diverse tokens or blocks in the digital medium. These tokens have two faces, enabling the display of various illustrations and notes. There are 12 different tokens in total. The city was rebuilt in the 4th century, and housing and public spaces were formed based on the grids. In the east-west direction, the center where the main streets pass is reserved for the Agora. The Agora, located in the center of the lower part of the city that expanded around the acropolis's hills, is where the people come together. Stoas and temples dominate the Agora. The Stoa, with their colonnaded structures, define the (half) surrounding area and provides shelter for diverse uses like commercial activities, small temples, and meeting places within its units. While the east Stoa hides a small temple, the meat and fish (food) market is behind the west stoa, and behind the north or sacred stoa, the Bouleuterion (council room) is located in Priene. (Wycherley, 1962). Public buildings such as the Bouleuterion (the meeting place of the city council) and the Prytaneion (the state guesthouse) have a variety of places in Wycherley's composition. However, these public buildings are generally located around the Agora. In addition to public and sacred spaces, the housing texture in the urban grid system shows the megaron, prostas, and peristyle typologies (Abbasoğlu, 1999). Doxiadis emphasized the human scale provided by the stoa formation's open, semi-open, and closed composition (Doxiadis, 1964). The city also has building blocks contrary to the grid order, as in Peiraeus. The stadium, terraced in a restricted area on hill slopes, is an example of placement contrary to the grid (Gates, 2015). It is seen that the topographical character is effective in positioning and the land use with terraces, especially enormous structures like the theatre, stadium, and gymnasium.
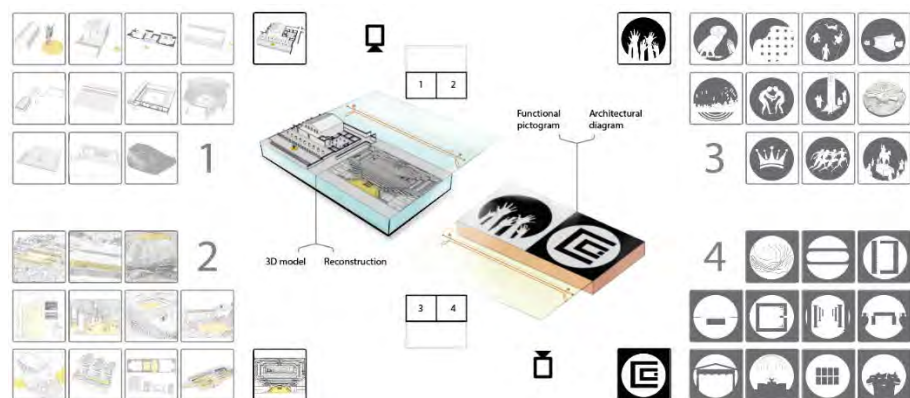
Figure 4. Complementary structure of the tokens/blocks.

Ostrakinda represents these elements in the 12 (two-sided) token/block system: Token 1 (Sacred Center / Acropolis), Token 2 (Social center / Agora), Token 3 (Democracy / Bouleterion and Prytaneion), Token 4 (Entertainment / Theatre), Token 5 (Trade / Macellum), Token

6 (Discipline / Gymnasium), Token 7 (Multifunctional / Stoa), Token 8 (Hygiene and socialization / Balnea and Thermae), Token 9 (Sacred / Temples of Athena and Zeus), Token 10 (Competition / Stadion), Token 11 (Death / Necropolis), Token 12 (Habitation / Megaron, prostas and peristyle houses) (Figure 4).

Play with Toolkit

In the second phase, Ostrakinda is tested in various environments, both individually and collaboratively. The toolkit, which has been designed and produced, is integrated in a modular manner into courses and workshops involving architecture and planning students. Within the context of the city of Priene, three crucial interactions are facilitated through the utilization of the board (grid frame) and its components (tokens). These interactions include the creation of networks between complementary tokens, the comparison and analysis of their functions and characteristics, and the appropriate positioning of the tokens on the grid. Furthermore, the group experiences highlight the importance of player interaction. The other critical point explored in Phase 2 is the establishment of a set of rules for the game. These rules aim to create a flexible, adaptive, and interactive tool in the game with abstract representations of the components and the neutral character of the grid board. Participants are provided with a template that includes game components, allowing them to create scenarios tailored to their preferences and learning objectives.

Ostrakinda tests were conducted through experimental studies within the action circle. Initially, the analog game (2D toolkit) was tested, followed by the digital game (3D toolkit) built upon the insights gained from the analog tests. These experimental studies were integrated into online classes and workshops, allowing both individual and collaborative gameplay. The testing process encompassed ideation, interface design, modeling and crafting, experimental study, analysis, and customization (Figure 5). The development of the game, which commenced in 2019, is an ongoing long-term research project that incorporates feedback obtained from experimental studies conducted in 2020, 2021, and 2022.
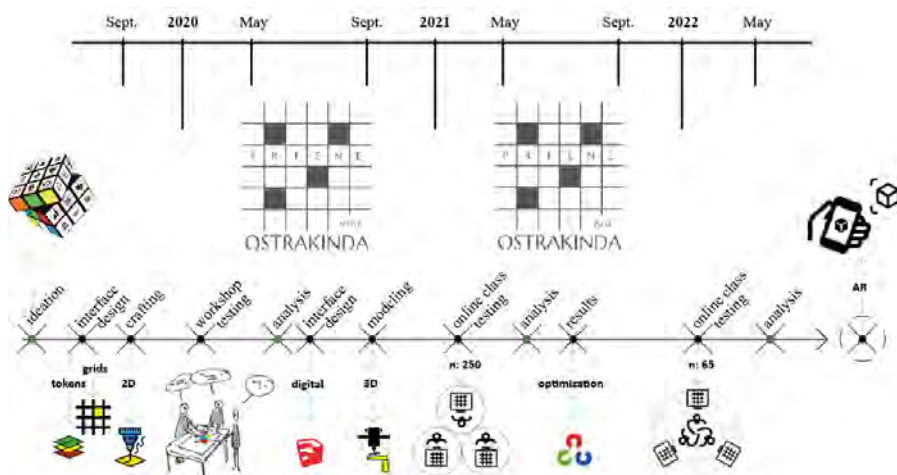

Figure 5. Essential design phases of Ostrakinda.

In the initial experimental study (Figure 6), a scaled board grid (1/20,000) is employed, featuring abstracted pictograms and diagrams on meticulously crafted physical tokens. These tangible tokens are utilized in both collaborative and individual gameplay sessions, facilitating valuable insights, findings, and critiques for the modification and refinement of the game.
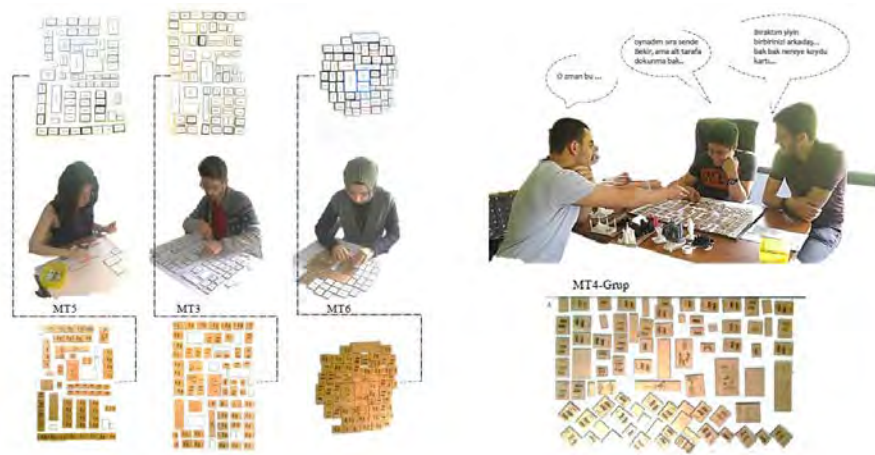
Figure 6. Collaborative and individual experiences (form of play).

Physical testing of the toolkit is limited by the number of crafted prototypes available. On the other hand, the digital toolkit was tested with the Zoom application, using breakout rooms for collaborative play of students. This allows for mass participation, process automation, and the analysis of computational outputs, offering distinct advantages in the digital environment. It is important to consider the affordances provided by both the physical and digital environments for player interaction (conflicts, co-decisions, and social learning) and the representation of urban elements. While the game's fundamental structure remains unchanged, the 2D tokens in the tangible toolkits are transformed into 3D blocks within the digital environment. However, the tools used in the experimental studies may differ between the physical and digital environments based on measured factors.

Analysis

The evaluation of a game's effectiveness encompasses various factors commonly identified in current studies. May's evaluation frame for gaming-simulations in architecture emphasizes involvement, learning derived, incentive to play, clear rules and instructions, good use of time, choices of strategy, stimulation of independent thought, validity of simulation, and having fun (May, 1979). Shi and Shih propose factors such as game goals, game mechanism, game fantasy, game value, interaction, freedom, narrative, sensation, challenges, sociality, flow, and mystery to construct a game-based learning (GBL) design model (Shi & Shih, 2015). In phase 3, an integrated model is used to evaluate Ostrakinda's effectiveness and compare it to the current and general framework. Five research questions (RQs) are addressed through the game process,

outputs, and participants' feedback to improve the effectiveness of the toolkit based on subject matter, learning objectives, and the actual needs of students. Various tools and methods, including statistical analysis, data visualization, and optimization techniques, are employed in line with the RQs (Figure 7).
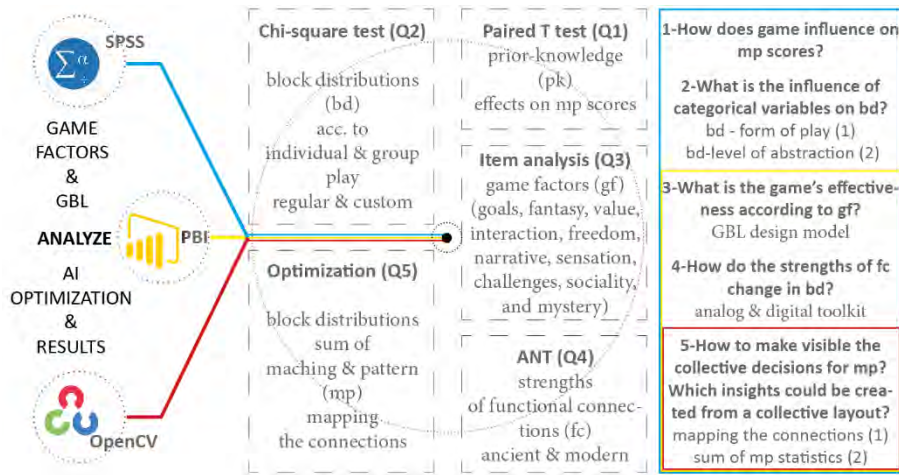
Figure 7. Research questions and data analysis tools.

The effects of the pre/post-game are measured using the Paired Samples t-Test, which compares the means taken from the same group (Q1). The relationships between categorical variables are measured using the Chi-square test (Q2). To ensure comparability with related studies, the general effects of the game are measured using the Game-Based Learning (GBL) item test (Q3). The Actor Network Theory (ANT) by Latour is employed (Q4) to reveal the strength and variation of connections and make the networks between the actors visible. The main actors in the play include the complex urban network, abstract interface tokens or blocks representing ancient-modern city components, type of grids on the game board, participants (individuals or groups), and the environment. ANT analysis allows for the examination of interactions between actors and the dominance of certain actors in the network (Latour, 2005). The network comprises the main focal points, such as public spaces (especially the city square), as well as mediator or secondary relations in various forms. ANT involves measuring three indicators: relationships between variables, distribution of functions based on distance, and inter-functional networks. Furthermore, the goal is to design a computational analysis model using optimization techniques to extract valuable insights from the large volume of game outputs (Q5) and assess its usability.

Experimental studies were conducted as part of the triple structure methodology (design, play, and analysis), involving the analysis of game outputs and the measurement of game effects through questionnaires.

RESULTS

Ostrakinda is analyzable based on the essential GBL factors in planning and design games, considering aspects such as type, model, integration, approaches, themes, scale, gains, and mediums (Figure 8).
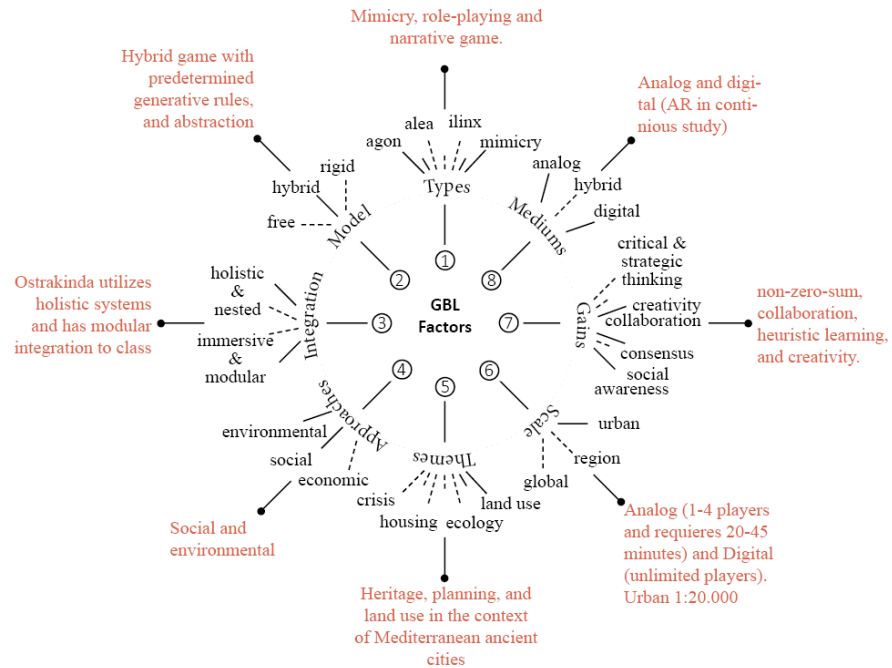
Figure 8. GBL components in Ostrakinda.

The identified GBL factors are pertinent to the RQs outlined in the methodology. This analysis structure can be expanded and refined by incorporating additional factors and sub-categories. It is crucial to further develop this structure based on the obtained results and reassess its alignment with previously analyzed GBL practices.

Pre-experiment

The initial research findings are focused on the problem area and target group of the study. Prior to the experimental studies, questionnaires were used to assess the architectural students' preliminary knowledge levels regarding ancient cities. The survey, conducted in 2021 and 2022, included three factors: students' level of interest in ancient cities, types of resources they utilize, and their prior knowledge of ancient cities. The pre-experiment involved a significant number of participants, with a gender ratio of 83 males to 171 females and an average age of 21. The level of interest in ancient cities was evaluated through questions related to visiting and familiarity. The findings were mapped on a national scale, indicating the locations of the students who participated online due to the COVID-19 pandemic and the distribution of ancient cities throughout the country. The map displayed increasing or decreasing colored rings to represent the level of familiarity and visiting frequency. While the participants were primarily

concentrated in Istanbul, there was notable diversity across other cities in the country.

1. İstanbul Arkeoloji müzesi
2. Çanakkale Troia örenyeri
3. Çanakkale Assos örenyeri
4. İzmir Pergamon örenyeri
5. İzmir Efes örenyeri
6. Aydın Priene örenyeri
7. Aydın Milet örenyeri
8. Aydın Didim örenyeri
9. Aydın Afrodisyas örenyeri
10. Muğla Knidos örenyeri
11. Muğla Kaunos örenyeri
12. Manisa Sardes örenyeri
13. Denizli Hierapolis örenyeri
14. Denizli Laodikeia örenyeri
15. Antalya Patara örenyeri
16. Antalya Olympos örenyeri
17. Antalya Perge örenyeri
18. Antalya Aspendos örenyeri
19. Burdur Sagalassos örenyeri
20. Mersin Anamorium örenyeri
21. Kütahya Aizonai örenyeri
22. Çorum Alacahöyük örenyeri
23. Çorum Boğazköy örenyeri
24. Nevşehir Derinkuyu Yeraltı Şehri
25. Nevşehir Kaymaklı Yeraltı Şehri
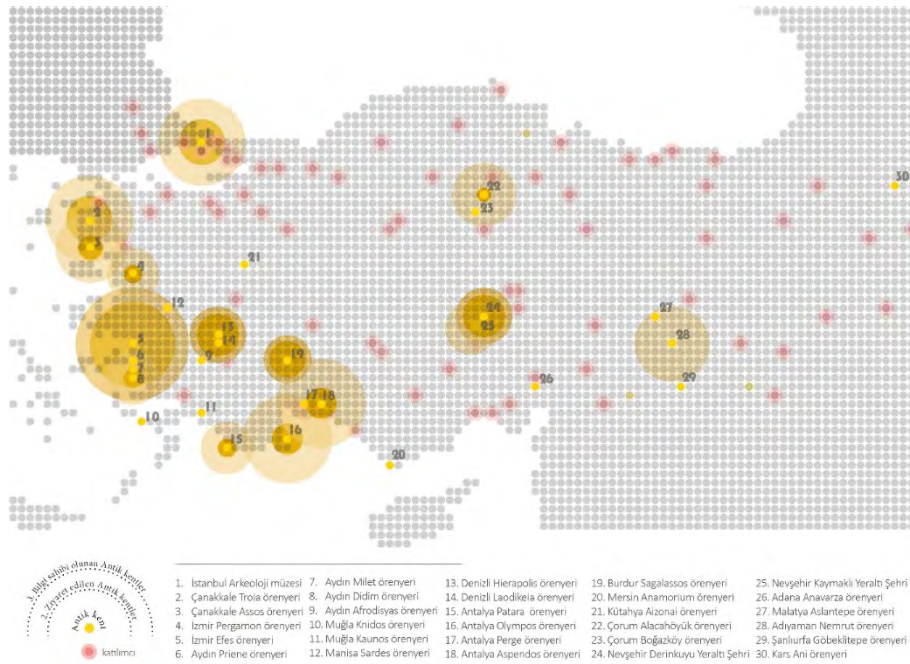26. Adana Anavarza örenyeri
27. Malatya Aslantepe örenyeri
28. Adıyaman Nemrut örenyeri
29. Şanlıurfa Göbeklitepe örenyeri
30. Kars Ani örenyeri

Figure 9. Mapping of level of interest of the participants for ancient cities in Turkey.

The participants' visits to ancient cities align with the tourism statistics of Turkey. The most frequently visited destinations, such as İzmir-Efes (36%), Çanakkale-Troia (26%), Antalya-Olympos (22%), and Nevşehir-Derinkuyu (15%), can be observed based on the 2019 visitor statistics of museums and archaeological sites provided by the Ministry of Culture and Tourism. However, familiarity with ancient cities exhibits a more dynamic pattern. For instance, while the familiarity level with the Şanlıurfa Göbeklitepe archaeological site is 52%, the visitation rate is only 5%. The findings regarding the type of resources used by students highlight the significance of higher education, travel experiences, and social media. Moreover, prior knowledge (pk) statistics reveal the participants' ability to match various concepts and terminologies associated with ancient cities. While Stadion, Temple, and Thermae are among the well-known terms, Gymnasium, Stoa, and Bouleuterion tend to be more confusing. At the end of the pre-test, students' interest in experiencing the GBL tool for ancient cities is measured using a 5-point Likert scale, with an average score of 4.23 (n: 254). These preliminary findings support for the development of alternative tools such as Ostrakinda.

Maching and Pattern Scores

The survey data collected before and after the game underwent statistical analysis using a Paired Samples t-Test in the SPSS software. The significant difference between the pre-test knowledge (pk) levels and the post-game scores highlights the impact of the game. Specifically, the scores of a group comprising 87 participants enrolled in an online class,

851

where the game was individually played, underwent meticulous examination. The scoring system employed ranged from 1 to 10. The interrelationships among the variables, encompassing pk, matching score (Score_M), and pattern score (Score_P), were thoroughly scrutinized. The analysis yielded substantial evidence of a significant association among these variables, with a two-tailed significance value of less than 0.01. Of notable interest, the strongest positive correlation coefficient of 0.596 was observed between the matching and pattern scores, thereby indicating a robust correlation between these factors (Table 2).

Table 2. Paired Samples t-Test

Paired Samples T Test		Correlations	Mean	sd	95% Confidence Interval of the Difference		t	df	Sig.
					Lower	Upper			
Pair 1	PK & Score_M	,376**	3,91	3,12	3,24	4,57	11,68	86	,000
Pair 2	PK & Score_P	,279	0,03	2,90	-,59	,64	,074	86	,941
	Score_M&P	,596**	3,93	2,50					

**Correlation is significant at the 0.01 level (2-tailed).

Categorical Variables for Block Distributions

Chi-square (X^2) tests are employed to analyze relations between the form of play and level of abstraction in the block distributions (bd) obtained from experimental studies. The bd were decoded based on the locations, including center, in-between, and periphery positioning on the grid. The first factor, form of play, explored the effects of collective and individual experiences, while the second factor, level of abstraction, investigated the impact of realistic and abstract grid planes on bd. The sample-sensitive X^2 test was conducted for mass participation and diverse game outputs of digital toolkit experiences. The OpenCV (Open-Source Computer Vision Library) was utilized for capturing the coordinates of the bd in massively game outputs. The bd data and the two-factor variables were then imported into the SPSS software for analysis. The X^2 and p values were calculated to determine the relationship between categorical variables and distributions of 12 blocks (Table 3). The results show a significant relationship between variables. To further refine the analysis, the position codes of the 12 blocks (center, in-between, and periphery) were simplified into true and false categories within the pattern, and the tests were repeated. Similar to the initial X^2 test, block diversity was taken into consideration, leading to a significant relationship between the variables. Notably, the level of abstraction value changed from 81,902a to 88,899a, while the form of play value shifted from 278,459a to 253,983a in these subsequent tests.

Table 3. Chi-square test results for block distributions

Chi-square X^2 Test			Block Distributions: Count-Expected Count											
			B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
realistic			54	62	61	47	74	46	51	50	65	50	125	257
			45,7	48,5	51,3	40,0	56,9	36,6	44,0	42,9	52,4	41,2	112,2	271,2
form of grid	X^2	81,902**												
	p	,000	27	24	30	24	27	19	27	26	28	23	74	224
abstract			35,3	37,5	39,7	31,0	44,1	28,4	34,0	33,1	40,6	31,8	86,8	209,8
individual			55	56	59	44	69	38	52	51	64	45	170	444
			67,8	71,9	76,1	59,4	84,5	54,4	65,3	63,6	77,8	61,1	166,5	402,4
form of play	X^2	278,459**												
	p	,000	26	30	32	27	32	27	26	25	29	28	29	37
group			13,2	14,1	14,9	11,6	16,5	10,6	12,7	12,4	15,2	11,9	32,5	78,6

**p< 0.01 level (2-tailed).
[a] 0 cells (0,0%) have expected count less than 5. The minimum expected count is 10,62.

Game's Effectiveness

A total of 65 students participated in the group experimental studies conducted in 2022 (Figure 4). These groups consisted of triple (n: 9), double (n: 15), and quadruple (n: 2) students. This sample was specifically chosen to assess the game factors, given its inclusion of collaborative experiences. Descriptive statistics were employed to analyze the effectiveness of Ostrakinda, as presented in Table 4. The factors indicate strong performance (above 4), except factor 8 (challenges). The factors indicate strong performance, with scores above 4, except for factor 8 (challenges). Notably, the scores of group gameplays show slight variations when compared to individually experienced games in 2021 (n: 250). Interestingly, values for individual (i) and group (g) experiences show similarities, such as freedom (4.14 (i) and 4.12 (g)), sensation (4.01 (i) and 4.03 (g)), and interaction (4.09 (i) and 4.23 (g)). However, there is a significant difference in challenge values between individual (3.38) and collaborative (3.82) experiences. Hence, form of play effects should be reconsidered and discussed.

Table 4. Descriptive statistics according to game factors (scale adapted from GBL design model of Shi & Shih)

Factor	Items	M		SD
(1) Game Goals	(a) The tasks (mp) have clear goals.	4,34	**4,32**	,69
	(b) The tasks are interesting.	4,26		,80
	(c) I'd like to complete the goals.	4,35		,76
(2) Mechanism	(a) The genre and gameplay are clear.	4,17	**4,22**	,95
	(b) The game rules are clear.	4,18		,85
	(c) I like its gameplay (mp).	4,29		,98
(3) Interaction	(a) The operational process is easy and intuitive.	4,23	**4,23**	,79
	(b) The block and grid tips are clear and guiding.	4,02		,94
	(c) The interaction with two-faces blocks is fun.	4,43		,68
(4) Freedom	(a) The selection and moves are easy to control.	4,26	**4,12**	,92
	(b) I can play the game in various ways/strategies.	4,00		1,0
	(c) There is enough movement space and variety.	4,11		,92
(5) Fantasy	(a) The style and overall appearance is consistent.	4,26	**4,34**	,85
	(b) The drawings and models fits its context.	4,34		,81
	(c) The story and components of the game match.	4,42		,68
(6) Narrative	(a) The game has rich content of ancient cities.	4,22	**4,31**	,82
	(b) The plot (grid pattern and tokens match) is logical.	4,32		,81
	(c) I'd like to follow the story's development.	4,40		,84
(7) Sensation	(a) It is convenient to experience in SketchUp.	4,00	**4,03**	1,1
	(b) Tools (camera, blocks handling) are functional.	3,97		1,0
	(c) Sound and interface need to be developed.	4,11		1,1
(8) Challenges	(a) The game is challenging.	2,85	**3,82**	1,1
	(b) Team makes it easier to achieve game goals.	4,38		,84
	(c) Different difficulty levels should be developed.	4,23		,93
(9) Sociality	(a) It's fun to play as a team.	4,49	**4,36**	,81
	(b) The game allows to compete and cooperate.	4,49		,83
	(c) I like to compete and cooperate with others.	4,09		1,0
			4,10	
(10) Mystery	(a) The game has surprises and interesting things.	4,05		,94
	(b) The game increased my interest for ancient cities.	4,15		,94

Correlations between factors were analyzed in SPSS. The strongest correlation was observed between factors 5 (fantasy) and 6 (narrative), while factor 8 (challenge) showed the weakest relationship with other factors (Table 5)

Table 5. Correlations between game factors

Factor Correlations	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	1	,453**	,602**	,425**	,600**	,667**	,499**	,331**	,531**	,471**
(2)	,453**	1	,650**	,680**	,467**	,430**	,530**	,144	,460**	,386**
(3)	,602**	,650**	1	,680**	,607**	,662**	,614**	,243	,537**	,546**
(4)	,425**	,680**	,680**	1	,596**	,576**	,597**	,239	,579**	,455**
(5)	,600**	,467**	,607**	,596**	1	,727**	,552**	,502**	,576**	,594**
(6)	,667**	,430**	,662**	,576**	,727**	1	,658**	,442**	,581**	,500**
(7)	,499**	,530**	,614**	,597**	,552**	,658**	1	,318**	,534**	,411**
(8)	,331**	,144	,243	,239	,502**	,442**	,318**	1	,610**	,466**
(9)	,531**	,460**	,537**	,579**	,576**	,581**	,534**	,610**	1	,639**
(10)	,471**	,386**	,546**	,455**	,594**	,500**	,411**	,466**	,639**	1

**Correlation is significant at the 0.01 level (2-tailed).

Distributions And Functional Networks

Besides online experimental studies, the physical toolkit was also tested in 2019 and 2020, yielding significant findings. The initial prototypes featured nine cards with varying levels of abstraction. The game objectives focused on the positioning of two-faced cards without matching. These findings influenced the development of the digital toolkit interface and the inclusion of more complex tasks. Testing involved both group (n:6) and individual play (n:10). The evaluation process included a survey capturing participants' experiences and addressing students' actual needs. Key tactics during the game included central planning, land use, landmarks, human scale, and establishing axes. Collaborative experiences tended to be longer due to discussions and consensus-building. Survey feedback highlighted the desire for increased card variety, inclusion of different and interesting cards, enhanced visual illustrations, and general improvements in game rules.

Function rankings and connection strengths of game blocks were used in collaborative urban design research (Bai et al., 2018). By employing a similar analysis, the network of adjacent tokens provided insights into the decision-making process for each city component on the grid. Within the framework of Actor-Network Theory (ANT), tokens were assigned weights based on network counts. Initially, the distance of functions placed in the grid system from the center was examined. The analysis revealed that cultural, official, trade, education, and multi-purpose buildings were positioned closer to the center. The variation between the color scale and the distribution of functions can be seen in the graphical

855

illustration. Following the distance-based distributions, networks between different functions (tokens) were mapped (Figure 10).
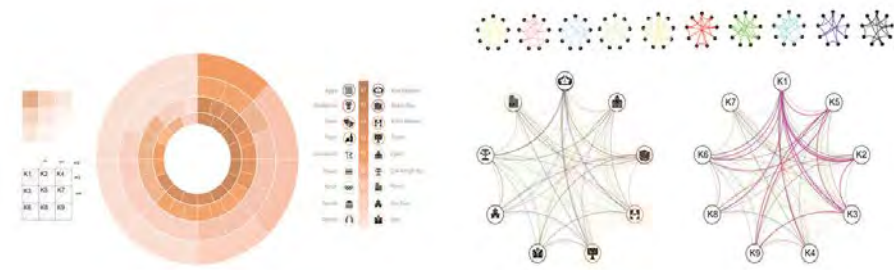
Figure 10. Distance-based distributions (left) and functional networks (right).

Collective Layout

When game outputs reach a massive scale that exceeds manual analysis capabilities, it becomes necessary to develop advanced analysis methods. In this regard, for the voluminous outputs of online experimental studies involving a large number of participants, a collective layout has been devised by integrating OpenCV and PowerBI. This approach facilitates practical and analytical optimization of the data. Initially, the visual grid and block data captured by the default game cameras are processed using a custom algorithm implemented in OpenCV. This algorithm extracts the coordinate information of the blocks involved in the matching and pattern tasks. Subsequently, the extracted data can be dynamically and parametrically analyzed using PowerBI, providing valuable insights (Figure 11).
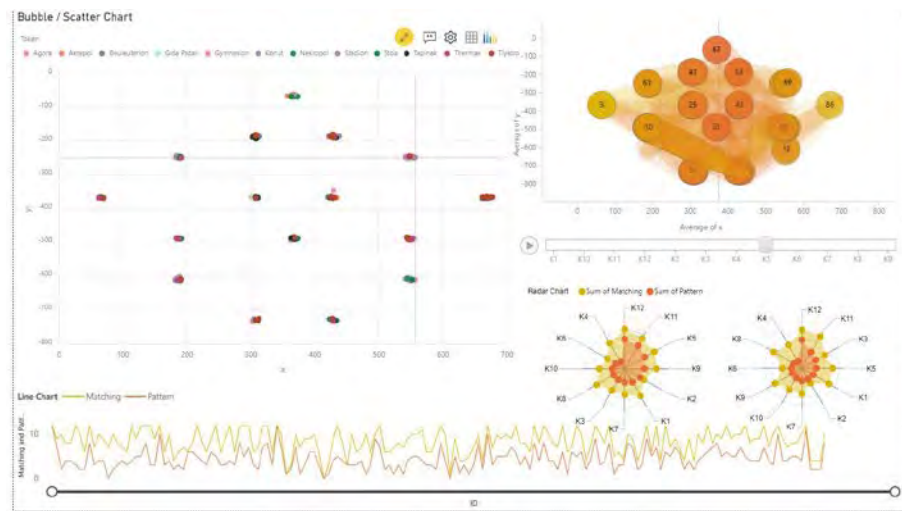
Figure 11. Open CV and Power BI analysis for bd results.

In Figure 11, the analysis panel presents four queries for data analysis: a bubble/scatter chart (1) for the sum of bd, an impact bubble chart (2) for block distributions by ID, a radar chart (3) for the sum of mp, and a line chart (4) for the relationship between pk and mp. The data can be analyzed parametrically using various filters, such as selected blocks, experimental studies, and ID. Figure 12 provides a graphical example relevant to Q1.

857
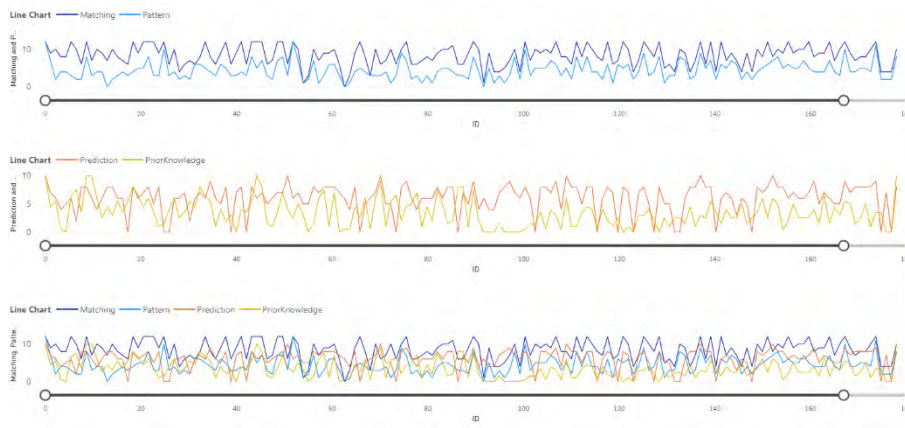
Figure 12. Line chart of pk and mp values.

Similarly, the distributions of the blocks offer comprehensive depictions of bd (Q2). For instance, K1 (acropolis) demonstrates a scattered distribution in the peripheral areas, while K12 (dwelling) exhibits a more concentrated distribution around the center (Figure 13).
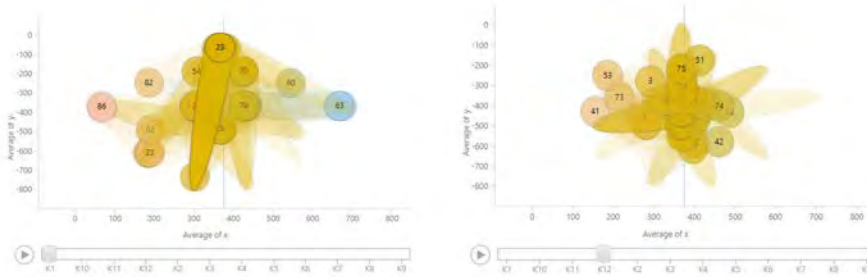
Figure 13. Impact bubble chart of bd.

DISCUSSION

The findings provide an opportunity to discuss each research question (RQ) separately. These RQs are interconnected with the objectives of the game and examining them individually enables a deeper analysis of their specific impacts. By delving into each RQ, a more holistic view of the game's overall effects can be obtained.

RQ1- How does the game influence matching and pattern scores? The effects of the game on matching and pattern scores were examined through a paired t-Test analysis. The results, presented in Table 2, show an increase in scores before and after gameplay. There appears to be a correlation between Score Matching and Score Pattern, as well as between PK and Score Matching. However, no significant correlation was found between PK and Score Pattern. These findings suggest the need for further discussion regarding the difficulty levels of both game tasks and their relationship with PK. While PK assessments directly address matching tasks, they do not encompass questions related to blocks, token positions, and urban pattern relationships. Thus, it is necessary to enhance the measurability of the PK assessment content. Moreover, the observed before-after effects not only confirm the positive effects of the game but also serve to highlight areas for further improvement within the action circle.

RQ2- What is the influence of play form and abstraction level on block distributions? Chi-square test results show significant relationships between block distributions and categorical variables. Consequently, it is necessary to identify and enhance the positive effects of grid forms and play configurations as optimal setups. Although evaluating the impact on game scores may be complex due to the interconnectedness of various factors, it does confirm the overall significant effects on block distributions. To encourage flexibility, learning, interaction, and creativity, it becomes important to offer diverse variations of grids and tokens in both realistic and abstract forms based on subject matter and learning objectives. Additionally, it is important to recognize that individual and group experiences within the game can elicit distinct interactions and promote learning through discussion, consensus-building, and competitive interaction.

RQ3- What is the game's effectiveness according to GBL factors? Descriptive statistics offer a comprehensive framework for assessing the effectiveness of Ostrakinda in terms of GBL factors. Overall, the results validate the usability of Ostrakinda. However, it is worth noting that factor 8 (challenges) shows lower positivity levels compared to other factors. Also, there is a significant difference in factor 8 between individual play (3.38) and collaborative play (3.82) experiences. This observation suggests that there is indeed room for improvement, particularly in factor 8, which specifically pertains to individual play. To address this, various modifications can be taken into consideration, including enhancing competition, refining scoring systems to incorporate rewards, diversifying game components, adjusting task difficulties, and improving the visibility of immediate decisions. On the other hand, the mean scores of game goals, fantasy, narrative, and sociality indicate strong performance. This distinction may be attributed to clarity of the game's rules and instructions, the attractiveness of the subject matter, and the decision-making processes that facilitate cooperation among players. It is important to note that a high score is not necessarily required for each factor. Therefore, in the ongoing research process, it is crucial to carefully weigh and prioritize the different GBL factors to ensure a more effective and well-rounded game design. Additionally, the GBL model employed in this paper (Shi & Shih, 2015) could be enhanced to create a more robust assessment scale tailored for design education, as suggested by May's gaming-simulations framework (May, 1979).

RQ4- How do the strengths of functional connections change in block distributions? The strengths of functional connections within bd make the relationship between diverse actors in the game visible. This enables a comprehensive analysis of game outputs, considering factors such as the abstraction levels of grids, the number and variety of tokens, rules and instructions, time utilization, and strategic choices. The patterns based on center and periphery positioning and relationships between various tokens are diversified and indicate some mostly repeated tactics and strategies in the results. However, two drawbacks have been

858

identified that prevent making consistent inferences. Firstly, it is crucial to measure the decision-making, iterative, and dialectic processes rather than solely focusing on the game outputs. Particularly for group interactions, protocol analysis plays a vital role in understanding the process dynamics. Secondly, analyzing the protocols and outputs within an online system with numerous participants poses a significant challenge. To address these limitations, attempts have been made within the scope of RQ5 to enhance the analysis process.

RQ5- How to make visible the collective decisions? Which insights could be created from a collective layout? The integration of OpenCV and PowerBI offers a strategic approach to analyze the extensive game outputs. The choice of analysis and visualization formats depends on the specific factors being measured. Among these formats, a line chart can effectively represent collective decisions, while an impact bubble chart can visually convey block distribution (bd) values. These visualizations complement the findings obtained through SPSS analysis and present the information in a clear and understandable format. The analysis method, characterized by its multilayer and parametric structure, can be associated with Actor-Network Theory (ANT). By utilizing this method, the ongoing process of protocol analysis can gain deeper insights into the dynamics at play. Alongside the RQs, limitations and potentials for the Ostrakinda are discussed in comparison to games analyzed in the literature.

Ostrakinda is evaluated within the context of Mediterranean geography, similar to the Teos of Dionysos Game, which conveys archaeological knowledge through playable interactions (Varinlioglu et al., 2017), and the Anatolian Journey Game, which explores the Silk Road (Afshar et al., 2021). The ancient Mediterranean subject serves as the motivation for this study, given the richness of Turkey's cultural heritage. The pre-experiment results, which help identify the actual demands of students, further support the game's development.

Furthermore, various gamification strategies employed in the context of heritage can be compared, with a specific focus on cognitive aspects, interaction forms, target groups, and mediums. One recent study explores the use of sand-box serious games for heritage, emphasizing the development of critical reasoning skills, mental map generation, evaluation of alternatives, as well as matching and iconographic analysis (Bellotti et al., 2013). Another study introduces interactive tabletops as a generative design tool, combining virtual reality, motion capture, and shape grammars, to effectively transmit heritage knowledge to a non-specialist audience in an appealing and informal manner (Figueiredo et al., 2014). Lastly, an exemplified study proposes the implementation of an immersive augmented reality game set within an archaeological site, aiming to increase visitors' interest and facilitate the dissemination of heritage (Varinlioglu & Halici, 2019). Collectively, these studies provide support for the effectiveness of gamification in heritage education, as it offers an enjoyable, interactive, and engaging learning experience.

GBL factors can be used to compare the proposed toolkit with other games, such as the educational puzzle game Slice It and the 3D role-playing history game Xiao-Mao (Shi & Shih, 2015). In Xiao-Mao, the score of narrative (factor 6) was higher (2.52) compared to Slice It! (4.22), while in Ostrakinda, the score was even higher (4.31). However, Slice It! scored higher (4.44) in terms of the game's challenge (item 8/a) compared to Xiao-Mao (3.80) and Ostrakinda (2.85). All three games performed well in terms of factor 1 (game goals), scoring above 4.20.

Feldt (1966) describes the most striking observation for the POGE as being completely engrossing, aligning with Csikszentmihalyi's flow theory. This theory suggests that when individuals are fully immersed in an activity, they experience heightened focus, enjoyment, and intrinsic motivation. Our study observed a higher level of involvement in gamified courses with Ostrakinda, particularly in group experiences. Similarly, Hart (2020) found that students preferred and were more engaged in gamified lectures compared to traditional courses.

The game Frequency 1550 (Admiraal et al., 2011), which focuses on medieval Amsterdam, facilitated a sense of flow among students, leading to increased engagement, collaborative learning, and active participation. Additionally, the factor of having fun (May, 1979) during gameplay was evident in Ostrakinda, with higher scores on items 3/c (4.43) and 9/a (4.49) on a 5-point Likert scale. Long-term findings since 2011, with 277 students experiencing 14 role-playing planning games, show an average enjoyment score of almost 8 and a usefulness rating of 7 on a scale from 0 to 10 (Stojanovski, 2020). Woodbury et al. (2001) provide tentative support for the role of play in early design education through engaging students in playful social settings using the Balance and Contrast game.

Design games can empower stakeholders during participatory process. User Game, Landscape Game, Technology Game, and The Scenario Game were utilized by Space Studio to explore various aspects of design and facilitate user-centred design (Brandt & Messeter, 2004). A role-play design game on senior housing named Character Game, aimed to creative thinking and empathic understanding, demonstrates various perceptions of a game as tools for designers, as a mindset for players, and as a structure for game designers (Vaajakallio & Mattelmäki, 2014). Perceiving of Ostrakinda by students also differentiated, such as an informal sesion within course, a socializing platform in group play, and a playful way for good use of time. The concept of players-as-producers emphasizes the learner's creative and constructive role, enhancing the flow experience and learning effects (Admiraal et al., 2011).

In games like Slum City (Silvestre, 2011) and ArchVille - CardboardCity (Peri, 2000), the use of tangible and digital toolkits is crucial. The advantages and limitations of these toolkits can be discussed in relation to the game objectives, considering the younger generation's interest and competence in digital tools. During the COVID-19 pandemic and earthquake crisis in Turkey, online workshops and courses highlight the distinct representation, scalability, interaction forms, and

accessibility offered by digital toolkits. The tangible toolkit of Ostrakinda stands out as an efficient interaction environment. Both toolkits align with the game objectives, and ongoing research involves the design and testing of an augmented reality (AR) environment.

CONCLUSION

In this paper, we presented the findings of a long-term experimental study that focused on game-based learning (GBL) in design education. The objective of our study was to explore the effectiveness of teaching the morphologies of ancient Mediterranean cities using a toolkit we developed called Ostrakinda. By conducting a comprehensive analysis of the game process, outputs, and participants' feedback, we aimed to investigate the game's usability, critical components, and overall effectiveness within the GBL framework. Our study revealed that the game had a positive impact on learning outcomes.

The influences of play form and abstraction level highlighted the significance of game design in promoting flexibility, learning, interaction, and creativity among players. We evaluated the game's effectiveness based on GBL factors, and while we observed positive results for game goals, fantasy, narrative, and sociality, there was room for improvement in the challenge factor. To address this, we suggested refining scoring systems, diversifying game components, adjusting task difficulties, and improving the visibility of immediate decisions, all in line with the desired learning objectives and relative factors. To gain deeper insights into the dynamics of the game and visualize collective decisions, we employed the integration of OpenCV and PowerBI, which provided an advanced strategy for analyzing extensive game outputs. This analytical approach, characterized by its multilayer and parametric structure, allowed for a more comprehensive understanding of the game's outcomes.

In comparing Ostrakinda with similar games in the literature, we found that it received higher scores, particularly in narrative, fantasy, interaction, sociality, game goals, and mechanism, scoring above 4.20. This emphasizes the strengths of Ostrakinda as a playful learning tool and its alignment with other gamification strategies employed for conveying heritage knowledges. However, several areas for improvement were identified throughout our study. These include enhancing the measurability of the GBL model for design education, exploring the differentiation of game effects across students' levels in the architectural and urban design fields, comparing different forms of play (individual and collective), and mediums, as well as prioritizing specific learning outcomes. By addressing these suggestions outlined in the paper, Ostrakinda can evolve into a versatile and engaging educational tool, facilitating playful learning experiences and fostering a deeper understanding of ancient cities.

In conclusion, our study contributes valuable empirical findings and insights to the field of GBL by presenting the design, test, and analysis

process in iterative action circles. By incorporating the suggested aspects for future research, as highlighted in the discussion section, Ostrakinda can further enhance its engagement, usefulness, and overall potential for effective learning.

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863

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Resume

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865

Research Article

Comparing the Past and Present Traces of Cultural Assets with the Reference of Literature and Architecture Arts to Each Other: Milas Greek Orthodox Church and Its Surroundings in Resat Nuri Güntekin's Novel "Ateş Gecesi" (Night of Fire)

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Abstract

Milas district, located in the province of Muğla, is a rich settlement in terms of historical and cultural monuments. Among the mentioned monuments in the settlement, especially religious monuments exhibit a great diversity and cover a wide range of historical periods. This diversity and historical range are directly related to cultural and religious communities that have lived in the region. However, some religious monuments in the district are disappearing or losing their architectural identities to a great extent due to reasons such as lack of preservation awareness, property issues, and neglect by users. One of the most important religious monuments that has largely lost its architectural identity in the Milas district is the Milas Greek Orthodox Church. This monument holds significant importance in Milas's cultural and religious inventory. The monument and its surroundings are also described in some parts of the plots in terms of some architectural features in Reşat Nuri Güntekin's novel Ateş Gecesi (Night of Fire), which was serialized in Yedigün Magazine in 1940 and published as a book in 1942. Although it has largely lost its architectural identity today, the Milas Greek Orthodox Church is still frequently mentioned in local legends, city memories, place and location names, and city literature, as can be seen in the pages of the "Ateş Gecesi" novel. The study aims to document and evaluate the changes that the Milas Greek Orthodox Church and its surroundings have undergone from past to present in the light of the "Ateş Gecesi" novel. The study was conducted in three stages, which involved examining the spatial and architectural descriptions mentioned in the Ateş Gecesi Novel, focusing on the narratives related to the Milas Greek Orthodox Church and its surroundings, and documenting and evaluating the current conditions of the spatial and architectural descriptions mentioned in the focused narratives. As a result of the study, it was determined that the Milas Rum Orthodox Church and its surroundings had largely lost their architectural identity over approximately a century, from the time the novel was written to the present day. However, within the interior space of the church structure, many elements related to the original architectural identity are still present. In contrast, it is considered that the outer walls, garden arrangement, and boundaries of the structure have lost their original qualities. It was also found that very few examples of traditional residential buildings that constitute the regional context have survived to the present day. In addition to its cultural and religious identity, the Milas Rum Orthodox Church necessitates the development of a comprehensive architectural conservation approach for its historical and archaeological context, monument, and immediate surroundings. Therefore, it is considered crucial to plan the region between the Milas Rum Orthodox Church and Milas Kartal Gazinosu, taking into account the Çaputçu Han section, with a comprehensive conservation approach.

INTRODUCTION

Milas district, located in the province of Muğla, is a rich settlement in terms of historical and cultural monuments. Among the mentioned monuments in the settlement, especially religious monuments exhibit a great diversity and cover a wide range of historical periods. This diversity and historical range are directly related to cultural and religious communities that have lived in the region. The religious monuments in the district are able to sustain their existence to a significant extent thanks to support from public authorities, local governments, and foundations, along with regular maintenance and restoration activities. However, some religious monuments in the district are disappearing or losing their architectural identities to a great extent due to reasons such as a lack of preservation awareness, property issues, and neglect by users (see Figure 1a-c).

It is known that these monuments, which have disappeared or largely lost their architectural identities, belonged to cultural and religious communities that once existed in the district but are now only the subject of historical research. These religious monuments, which no longer exist today, carry important references to Milas's urban history and urban culture. They can be easily traced through local legends, city memories, place and location names, and city literature. Furthermore, these religious monuments often served as focal points of life for the communities they represented in the past, leading to the concentration of certain historical accumulations in the locations where these monuments were situated. Through these accumulations, it is considered that these religious monuments, although they have disappeared or largely lost their architectural identities, continue to exist in their original locations. Regarding this evaluation, Lektorski (2016: 237) states that a disappeared object always leaves a trace. Eisenman (1984: 7) introduces the concept of "locus" and defines it as a specific structure determined not only by space but also by time, topography, and form, and most importantly, as a place where both old and new events follow each other. Rossi (1984: 50), in addition to this statement, argues that the shapes, formations, and evolutions of land parcels in a city represent a long history of city ownership and closely related classes. Rossi (1984: 59), in reference to the concept of "persistence" originally proposed by Marcel Poète, argues that "persistence" or, in Turkish, "süreklilikler," emerge through monuments, which are the physical signs of the past. Doyduk (2010: 39) also points out that these places, which have lost objects on their

867

Comparing the Past and Present Traces of Cultural Assets with the Reference of
Literature and Architecture Arts to Each Other: Milas Greek Orthodox Church and Its
Surroundings in Resat Nuri Güntekin's Novel "Ateş Gecesi" (Night of Fire)

surfaces (lost monuments) and are part of the historical context, are not only valuable as archaeological research areas but also as spaces where rituals, habits, or socio-political events from ancient times have accumulated. In the Milas district, one of the most important religious monuments, which embodies many of the situations indicated by these views and has largely lost its architectural identity, is the Milas Greek Orthodox Church. This monument holds significant importance in Milas's cultural and religious inventory. Additionally, in Reşat Nuri Güntekin's novel "Ateş Gecesi", serialized in the Yedigün Magazine in 1940 and published as a book in 1942 (Poyraz and Alpbek, 1957: 9), certain sections describe some architectural features of the church (Güntekin, 2018). Reşat Nuri Güntekin is believed to have visited Milas in either 1907 or 1931, according to Kunduracıoğlu (2022: 211), as reported by Olcay Akdeniz. Looking at the spatial and architectural descriptions in the novel, it can be understood that the author made detailed observations about the Milas Greek Orthodox Church and its surroundings. Although it has largely lost its architectural identity today, the Milas Greek Orthodox Church is still frequently mentioned in local legends, city memories, place and location names, and city literature, as can be seen in the pages of the "Ateş Gecesi" novel. In addition to its cultural and religious identity, the historical and archaeological fabric of the surrounding area and the monument itself necessitate a comprehensive architectural preservation approach. When creating preservation approaches, special attention is given to the careful examination of spatial and architectural references related to the past of the monuments (Ahunbay, 2009: 60-62, 67, 85-86, 130). Therefore, in the context of the future preservation approaches that may be created for the Milas Greek Orthodox Church and its surroundings, it is thought that the spatial and architectural descriptions in the "Ateş Gecesi" novel can be an important source of data. Thus, this study aims to document and evaluate the changes that the Milas Greek Orthodox Church and its surroundings have undergone from the past to the present, illuminated by the "Ateş Gecesi" novel. The study is believed to provide a comparative contribution, both in textual content and in the compilation of current data, to the architectural preservation approaches that may be developed for the Milas Greek Orthodox Church and its surroundings in the coming years. Additionally, the study is considered to create a new perspective on the relationship between literary texts and architectural preservation approaches.

MATERIAL OF THE STUDY

It is known that the presence of the Greek community in Milas dates back to long before the present day. Based on the information provided by Adıyeke (1994: 104) and historical sources, there was a Greek community in Milas that can be traced back to the 16th century. This community was clustered in the town in the 19th century (Çolak, 2003: 158; Çolak, 2004: 60), and at the beginning of the 20th century, it created its social institutions and organizations on an inclusive scale

868

(Kılıçoğlu Cihangir, 2017: 327). This community clustered in the town in the 19th century (Çolak, 2003: 158; Çolak, 2004: 60), and in the early 20th century, it established its social institutions and organizations on a comprehensive scale (Kılıçoğlu Cihangir, 2017: 327). The Greek community is considered the second element in Milas (Adıyeke, 2017: 89). In the late 19th-century population data, the Greek population in the district appeared as the second-largest ethnic and religious community (Akarca and Akarca, 1954: 11). For a Greek Orthodox community of this size, the church institution in Milas undoubtedly constituted one of the focal points of life due to daily and weekly worship, wedding ceremonies, and funeral rituals. The focal point hosting the church institution in Milas is the Greek Orthodox Church, located near a school, as mentioned by Adıyeke (1994: 70, 82, 106). Regarding the church, Akarca and Akarca (1954: 94-95) state that the church is dedicated to the Virgin Mary and mention that after a major renovation in 1931, the church building was used as a Military Recruitment Office. Adıyeke (2017: 72, 91) mentions that the church is dated to the early 19th century and that the church building was demolished in 1936 after the Greek community migrated to Greece in the population exchange. Kunduracıoğlu (2022: 214-215), referring to Olcay Akdeniz's research on the post-exchange state of the church, mentions that the monument was first used as a warehouse, then the church walls were cut from the foundation to the third meter in 1936 to build a Military Recruitment Office, and later a new building was constructed with masonry walls. As of today, the monument is located on parcel number 6 of block 141, within the boundaries of Gazipaşa Neighborhood, Milas Center (see Figure 2a, b). The external walls of the monument are largely hidden due to adjacent buildings. However, the northwest and northeast facades of the monument constitute the visible surfaces of the monument in the urban space (see Figure 2c, d). Examinations of the facades reveal that the monument is approximately 10.60 meters in height from the ground level. It can be easily understood that the exterior facade, which combines masonry and reinforced concrete construction systems, does not represent the original facade pattern of the church. It is also difficult to speculate about the original entrance door and entrance structure of the church due to the surrounding structures. In the current situation, entry to the monument is through a triangular-shaped area, which makes a 45-degree angle with Kışla Avenue (see Figure 2b, c). The entrance leads to a space thought to be rectangular and serves as a narthex, which is believed to be the entrance area of the church (see Figure 2e). Today, this section houses the ticket counters of a cultural center (see Figure 2e).

869

Comparing the Past and Present Traces of Cultural Assets with the Reference of
Literature and Architecture Arts to Each Other: Milas Greek Orthodox Church and Its
Surroundings in Resat Nuri Güntekin's Novel "Ateş Gecesi" (Night of Fire)

Figure 2. Visual data related to the current condition of the church; a) location of the monument within Milas (Google Earth Pro, 2023); b) position of the monument within the current urban texture and parcel layout (TKGM, 2023a); c) northwest facade of the monument; d) northeast facade of the monument; e) space thought to be the narthex; f) main space thought to be the naos; g) floor and roof of the main space; h) door from the main space to the garden.

870

From this space, a door in the southeast direction leads to the main space, thought to be a rectangular nave (see Figure 2f). The floor of the space, which is currently used as an event center, shows a sloping feature due to its usage, and this slope is divided into sections by steps (see Figure 2g). The upper covering of the nave is in the form of a pointed vault, supported by distinct arches (see Figure 2g). Two doors also open to the northeast from the nave, and these doors overlook a garden (see Figure 2h). At the southeast end of the main space, there is a section arranged as a stage, which is approximately 1.02 meters higher than the ground level. Before the alteration of the monument, this section is thought to have had an apse. Currently, the monument serves as the Prof. Dr. Aşkıdil Akarca Stage under the jurisdiction of the Milas Municipality.

METHODOLOGY OF THE STUDY

The study was conducted in three stages, which involved examining the spatial and architectural descriptions mentioned in the Ateş Gecesi Novel, focusing on the narratives related to the Milas Greek Orthodox Church and its surroundings, and documenting and evaluating the current conditions of the spatial and architectural descriptions mentioned in the focused narratives. In the first stage of the process, the 2018 edition of the Ateş Gecesi Novel published by İnkılâp Kitabevi was read, and the spatial and architectural descriptions mentioned within the novel were thoroughly examined (Güntekin, 2018). In the second stage, the study concentrated on the narratives related to the Church structure and its surroundings. These focused narratives were transferred to this study in the form of paragraphs that maintain coherence and context to avoid disconnection from the main text as much as possible. In the third stage, the spatial and architectural descriptions mentioned in the focused narratives were photographed and documented in their current conditions. They were then evaluated by comparing them with the past. Throughout these processes, spatial and architectural descriptions were documented as much as possible from the perspectives of location and settlement as mentioned in the texts.

STUDY RESULTS AND DISCUSSION

When the spatial and architectural descriptions in the novel are examined, four distinct groups of descriptions stand out, which provide insights into the settlement structure of the region where the Rum Orthodox community lived in Milas, depict daily life in this settlement, describe the Ateş Yortusu or Ateş Gecesi (Fire Festival or Fire Night) – a significant celebration for the Rum Orthodox community, and portray the educational and religious structures of the Rum Orthodox community. Looking at the descriptions related to the settlement structure of the region where the Rum Orthodox community lived in Milas, it is conveyed that the settlement was a neighborhood consisting of old houses arranged around a square. This square was mentioned to be muddy in winter and dusty in summer (Güntekin, 2018: 42). It is emphasized that the heart of the neighborhood was the square located in front of the church/monastery (Güntekin, 2018: 21). In modern times, it is considered that the square where Kışla Caddesi and Sabunhane Caddesi intersect is the most suitable place that corresponds to this description (see Figure 3a, b). Today, there are occasionally historical and traditional residential buildings around this square (see Figure 3c, d). The neighborhood described by the author (Church District) extends towards the back streets of the mentioned square (Güntekin, 2018: 43), and in these mentioned streets, there is hardly any encounter with residential structures displaying historical or traditional features. The descriptions indicate that the doors of houses in the settlement were always open, and elderly women wove in dim courtyards (Güntekin, 2018: 42). It is mentioned that the facades of the houses were ash-

Comparing the Past and Present Traces of Cultural Assets with the Reference of
Literature and Architecture Arts to Each Other: Milas Greek Orthodox Church and Its
Surroundings in Resat Nuri Güntekin's Novel "Ateş Gecesi" (Night of Fire)

colored, adorned with slender vines and ivy, and that geranium and basil pots were placed in front of the windows (Güntekin, 2018: 42). However, it was challenging to find any present-day locations that match these descriptions. Most of the buildings in the region have construction plaques indicating they were built between 1930 and 1960 (see Figure 3e, f). Additionally, considering design trends and construction technologies, some buildings in the region could be dated between 1960 and 2000. Therefore, it is possible that the residential buildings described in the novel may have disappeared between 1930 and 2000. Nevertheless, it is believed that a 2-story building located at plot no. 142, parcel no. 4 on Kışla Caddesi, with a construction plaque dating back to 1913 (Figure 3g, h), could be one of the described houses in the novel.

Figure 3. Visual data related to the settlement texture of the Milas region where the Greek Orthodox community lived; a) location of the square where Kışla Caddesi and Sabunhane Caddesi intersect in the urban texture (TKGM, 2023a); b) view of the square; c) historic residential structure located on plot no. 131, parcel no. 31; d) traditional residential structure located on plot no. 15, parcel no. 8; e-f) some residential-commercial structures built between 1930-1960; g-h) residential structure with a construction inscription from 1913 located on plot no. 142, parcel no. 4 on Kışla Caddesi.

872

The slender vines and ivy found around this building's facades also resemble the descriptions in the novel. When examining the descriptions of daily life in the settlement, it is observed that life in the neighborhood was divided into two different periods: daytime and evening. Descriptions of daytime activities indicate that people sat around the square, children played, and young people strolled (Güntekin, 2018: 21). It is mentioned that during the day, only women and the elderly remained in the neighborhood, while men and young girls went to work, and children attended the church school (Güntekin, 2018: 42). Descriptions of the evening section of life in the neighborhood suggest that life inside homes gradually spilled into the streets as evening approached (Güntekin, 2018: 42-43). It is narrated that children rushed out from the church to the square during this process (Güntekin, 2018: 42). As night fell, people came out into the streets in a cheerful crowd through the side streets (Güntekin, 2018: 43). Comparing these descriptions with the present, it can be observed that the square, both during the day and in the evening, is now described as quiet, calm, and even stagnant. Descriptions of the Ateş Yortusu or Ateş Gecesi, a significant celebration for the Rum Orthodox community, provide numerous details about this ritual in the novel. Koçu (1960: 1270) mentions that Ateş Gecesi was a festival celebrated by Rum Orthodox communities until the proclamation of the Republic, which included enthusiastic celebrations in which even Turkish Muslim communities in the ashmaker profession participated. Koçu (1960: 1270-1271) further states that the festival was celebrated by Istanbul Greeks on June 24th with large fires lit in squares and courtyards, with people jumping over these fires for good luck, and it was dedicated to Ayios Yuanis / Saint John. In the novel, it is mentioned that the Kilise Mahallesi (Church Neighborhood) becomes crowded, with the addition of many Muslim and Jewish spectators from other parts of Milas, making it busier than usual during the celebration (Güntekin, 2018: 74). It is described that during the celebration, the elderly of the neighborhood, dressed for the festival, entered the church when the church bell rang, marching in groups (Güntekin, 2018: 74). Especially after dark, it is narrated that brushwood fires were lit in the square and alleyways (Güntekin, 2018: 74). People were said to jump over these fires while having fun (Güntekin, 2018: 74). It is also understood that the fire-jumping ritual took place not only in the square and alleyways but also in the small, tree-filled garden that was entered through the courtyard of the monastery (Güntekin, 2018: 75). Comparing these descriptions of the Ateş Yortusu or Ateş Gecesi with the present, it can be seen that such a ritual is no longer performed in Milas. When the descriptions related to the educational and religious structures of the Rum Orthodox community are examined, it is mentioned that the church or monastery opened onto a square (Güntekin, 2018: 21). This square, as mentioned before, is considered to be the square where Kışla Caddesi and Sabunhane Caddesi intersect. It is emphasized that there was a door on

873

the wall of the church (Güntekin, 2018: 42), but no trace of this door can be found today. Additionally, it is stated that the church also had a school (Güntekin, 2018: 42). It is mentioned that the church had a large door that was always closed but opened during Ateş Yortusu or Ateş Gecesi celebrations (Güntekin, 2018: 74), and no traces of this door could be found. Considering these descriptions, it is speculated that the church and monastery structures may have been separate buildings.

Regarding the church and monastery structures, it is observed in the novel that the concepts of church and monastery were sometimes used interchangeably and sometimes described as separate structures. This perception is influenced by some variations in the descriptions in the text. The novel also mentions a monastery structure next to the church (Güntekin, 2018: 75). The main character, Kemal, is brought to a small but very wooded garden from the monastery's courtyard by Stematula, and this garden is said to be surrounded by high walls (Güntekin, 2018: 75). Although it is not entirely clear to which structure this monastery corresponds, it is emphasized that the area surrounding the small but heavily treed garden entered from the monastery's courtyard is enclosed by high walls (Güntekin, 2018: 75). Another mention regarding the monastery is when the protagonist Kemal enters the inner courtyard of the monastery, which is intended exclusively for the priests (Güntekin, 2018: 146). In light of these descriptions, it can be considered that the church and monastery structures may be separate buildings.

Regarding the church and monastery structures, the plot developments in the novel have been examined on an urban scale, and concerning urban topography and positional references, it is thought that the monastery structure may be located at Milas Kartal Gazinosu (Military Casino) (see Figure 4). It is considered that the high retaining walls to the north of Milas Kartal Gazinosu, which emerged due to the elevation difference, could be spatially compatible with the situation mentioned in the novel when entering a small but multi-tree garden from the courtyard of the monastery and surrounding this garden with high walls (Figure 4). In addition, the distance between the church structure and Milas Kartal Gazinosu being less than 100 meters suggests that the relationship between these two structures in the past may have been much stronger compared to the present (see Figure 4). Furthermore, the church school may have been part of this monastery. Based on these assessments, it is conceivable that Milas Kartal Gazinosu could correspond to the described structures. However, since Milas Kartal Gazinosu is under the use of the Turkish Armed Forces, no detailed examination could be conducted regarding this building. Therefore, it is currently difficult to present these assessments as definitive conclusions.

Figure 4. Milas Greek Orthodox Church and its surroundings within the context of the event sequences in the novel (TKGM, 2023a, b, c).

CONCLUSION

The comparative analysis of cultural assets, their past conditions, and contexts with their current situations and contexts through literary texts can provide valuable data in the process of developing architectural conservation approaches. In the scope of this study, the spatial and architectural descriptions related to the Milas Rum Orthodox Church and its surroundings in Reşat Nuri Güntekin's novel "Ateş Gecesi" were examined, and the assessments made were discussed in the context of the event sequences and present-day settlement conditions. As a result of the study, it was determined that the Milas Rum Orthodox Church and its surroundings had largely lost their architectural identity over approximately a century, from the time the novel was written to the present day. However, within the interior space of the church structure, many elements related to the original architectural identity are still present. In contrast, it is considered that the outer walls, garden arrangement, and boundaries of the structure have lost their original qualities. It was also found that very few examples of traditional residential buildings that constitute the regional context have survived to the present day. In addition to its cultural and religious identity, the Milas Rum Orthodox Church necessitates the development of a comprehensive architectural conservation approach for its historical and archaeological context, monument, and immediate surroundings. Therefore, it is considered crucial to plan the region between the Milas Rum Orthodox Church and Milas Kartal Gazinosu, taking into account the Çaputçu Han section, with a comprehensive conservation approach. This way, it is evaluated that at least the remaining cultural heritage elements related to the Milas Rum Orthodox Church and its surroundings, which are frequently mentioned in settlement legends, city memories, place and location names, and urban literature, can be passed on to future generations in their current conditions, at least without further destruction.

Comparing the Past and Present Traces of Cultural Assets with the Reference of
Literature and Architecture Arts to Each Other: Milas Greek Orthodox Church and Its
Surroundings in Resat Nuri Güntekin's Novel "Ateş Gecesi" (Night of Fire)

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Resume

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877

Research Article

Accessibility of Virtual Museum Spaces in the 21st Century in Turkey

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Abstract

Museums, which are the embodiment of art, exhibition, culture, and science, have started to offer virtual space experiences as well as traditional physical space experiences in recent years. In addition to the development of technology, the pandemic, which started in 2019 and affected the whole world, has also been effective in accelerating the transformation of museums from physical space to virtual space. The increasing use of virtual museums directly concerns different user groups in terms of accessibility. In a physical museum experience, solutions that appeal to different types of users are generally produced. Thanks to these solutions, an individual with any disability can be included in the space with all senses such as sight, touch, smell, and hearing during a museum visit, while the lack of inclusion of all senses in the virtual space experience causes the experience to be more limited. This study discusses this limitation in terms of accessibility. How can the virtual space experience be more accessible for different types of users? Can different solutions be offered to all user groups for a better understanding of the space and the art product? These questions constitute the research questions of this study. In this context, this study aims to examine how accessible virtual museums are. The study has conducted this inquiry through 59 virtual museums in Turkey. As a method, virtual museums were classified and tabulated in terms of their accessibility levels in line with their characteristics. It was concluded that there are deficiencies in the experience of different types of users and various suggestions were made in terms of virtual accessibility.

880

INTRODUCTION

Design can be defined as the process of knowledge acquisition, shaping, constructing, and envisioning or producing something in mind (Hardt, 2006; Evcil, 2014). Design can be accessible if it meets the vital needs of individuals. Therefore, making a design accessible requires not only making it accessible through adaptations for those in need but also focusing on its accessibility for all human situations and user states (Tutal, 2012).

When an analysis is made from the recent past to the present, it is seen that despite the design approaches that try to be inclusive today, the common design approach is shaped according to the average user group, and solutions to ensure accessibility in terms of design are provided by special designs or are generally adapted to the existing design. However, putting the human at the center of design keeps the approaches of being inclusive, being for everyone, or being universal on the agenda of the design field as indispensable for a sustainable urban life since the last quarter of the 20th century like environmental values. These approaches elevate "accessibility," a prerequisite for independent living and full participation in life, as a way to guarantee the active participation of every individual in society, into one of the indispensable themes of the agenda in the literature on international human rights (Chan & Zoellick, 2011). More accessible, inclusive environments for user groups are being considered and efforts are made by different disciplines to produce experimental solutions. (Iwarsson & Stahl, 2003) (Acırlı & Kandemir, 2021).

Accessibility-based approaches arising from the disability rights movement after the Second World War are inclusive for everyone or universal approaches, also launched by different names like 'Life Span Design', 'Transgenerational Design', 'Aged Friendly Design', and 'Design for the no-So Average' (Chan, Lee, & Chan, 2009) (Herwig, 2008) (Theil, etc. al., 2022) (Arning & Ziefle , 2007) (Handler, 2018). These accessibility-based design approaches, which often have the same goal in mind, are commonly based on the characteristics like equality, inclusiveness, sensibility/sensitivity, appropriateness, realism, respect for user diversity, healthfulness, functionality, perceptibility, sustainability, availability, simplicity, intuitional and easy usability, safe and risk-free, tolerance of usage errors, ergonomics, and suitability for use (Persson, etc. al., 2015). They are characterized as being ergonomic, suitable for use, and able to tolerate usage errors. Undoubtedly, behind this diversity, which is similar to each other the responsibilities of countries arising from international agreements, national and international policies, and the social, cultural, and economic differences between countries in their approach to the subject play an important role (Tutal, 2018).

Accessibility, as one of the areas of human rights that is as problematic as discrimination and even includes discrimination, has recently gained a rightful place in international arenas. (United Nations

Human Rights, 2009). Accessibility, besides being a means of exercising rights for the disabled, is also a condition for living independently and fully participating in all areas of social life. (Çağlar, 2012). The accessible design has often focused on the accessibility of space, addressing the issue through ramps, elevators, toilets, and sometimes parking lots, and even focusing on wheelchair users, rather than providing accessibility for everyone, anytime and anywhere. Apart from a limited number of applications for full participation in daily life, regulations for the visually impaired have been included in the area of accessibility with widely tangible walking surfaces and provision of explanations in Braille, while regulations for the hearing impaired are generally included in the area of accessibility with induction loop systems (Ministry of Family, Labor and Social Services of the Republic of Turkey, 2021). Regulations for other areas of daily life such as transportation, information, or accessibility of services have also remained far from the discussion in this environment where multiple disabilities, children, or the elderly are almost never taken into account and even the accessibility of space is inadequate. Aspects like creating barriers through design instead of making it accessible, weakening comfort and quality of life, and even making the average user group the target audience of the design have caused disabilities in the participation of the users of the design in daily life (Tutal, 2018). While, on the one hand, the process of putting barriers through design continues, on the other hand, inclusive or universal design for all has become a design culture, aiming to reach situations where not a single user is left at a disadvantage while seeking answers to the ever-changing needs of society. In particular, the widespread use of the concept of accessibility and its emergence on the agenda in this process has made it an inclusive and effective component for everyone under the roof of universal design.

881

In seeking to improve quality of life, accessibility is a fundamental right as it is a means of enabling everyone to participate in daily life at all times and in all places, uninterruptedly and independently, and a basic condition for full participation in all areas of social life (Tutal, 2015). This right has been also supported by the UN Convention on the Rights of Persons with Disabilities, the most important international document in recent years, and has been recognized as one of the eight fundamental principles of the convention. The measures taken by the signatory countries are set out in Article 9.

"...To enable persons with disabilities to live independently and participate fully in all aspects of life, states parties shall take appropriate measures to ensure persons with disabilities have access, on an equal basis with others, to the physical environment, transportation, information, and communications, including information and communications technologies and systems, and other facilities and services open or provided to the public, both in urban and in rural areas.

These measures shall include the identification and elimination of obstacles and barriers to accessibility.", shall apply to, inter alia:

9/1(a) Buildings, roads, transportation, and other indoor and outdoor facilities, including schools, housing, medical facilities, and workplaces.

9/1(b) Information, communications, and other services, including electronic services and emergency services (United Nations Human Rights, 2009).

The Convention includes the ability for Living Independently and Being Included in the Community (Article 19/c), Freedom of Expression and Opinion, Access to Information (Article 21/a, c, d), and Participation in Cultural Life (Article 30), which aim to ensure virtual accessibility, which is the subject of this research. In addition, Articles 1, 2, 3, 4, 5, and 6 give responsibilities to States Parties. These responsibilities are included in Articles 19 and 21 of the convention.

19/(c) Community services and facilities for the general population are available on an equal basis to persons with disabilities and respond to their needs.

21/(a) Providing information for the public in accessible formats and technologies appropriate to different kinds of disabilities promptly and at no additional cost to persons with disabilities,

21/(c) Encourage private organizations providing services to the public, including the Internet, to provide information and services in formats accessible and usable for persons with disabilities,

21/(d) Encourage the mass media, including those providing information over the internet, to make their services accessible to persons with disabilities, and

Provisions relevant to the subject of this study are included in Article 30 of the Convention on Participation in Cultural Life, Recreation, Leisure, and Sports. According to Article 30, States Parties recognize the right of persons with disabilities to participate in life on an equal basis with other individuals without disabilities and, in this context, are obliged to take the necessary measures to ensure that persons with disabilities have access to cultural materials and activities in practicable forms. They are also obliged to provide access to places where cultural activities take place or services are provided, such as theaters, museums, cinemas, libraries, and touristic services. They will take measures to ensure that persons with disabilities have the opportunity to develop and use their creative, artistic, and intellectual capacities, not only for their own benefit but also to enrich society for all. States Parties are obliged to take all necessary measures to ensure that laws protecting intellectual property rights do not constitute an inappropriate or discriminatory barrier to the access to cultural materials by persons with disabilities and to do so by international law (United Nations Human Rights, 2009).

This study focuses on the virtual accessibility of museums in the wake of COVID-19, the effects of which are still ongoing. Focusing on 59

virtual museums in Turkey, the study discusses the accessibility issue in the virtual environment due to the restrictions imposed on the use of public spaces due to the COVID-19 pandemic. In this context, a qualitative research method was used in the present study, and a case study was carried out to analyze and interpret the museums holistically within their own borders. As identified by the General Directorate of Cultural Heritage and Museums and the Culture and Tourism Association, 59 museums, providing virtual museum services as indoor spaces, of the 80 museums providing virtual museum services, including open museum spaces such as ancient cities, ruins, and ancient theaters, were included in this study.

EXHIBITION SPACES, INTERACTION, AND MUSEUMS

The aim of art is for every audience to be able to make sense of the artist's free composition by organizing a series of communication effects (Eco, 2001). Art, which is a phenomenon based on the audience's relationship with the product, is located in spaces accessible to users according to accessibility criteria and is open to interaction by appealing to all segments of society without discrimination (Lacy, 1995; Ercan, 2013).

As a result of technological developments, the venues where artworks are exhibited are becoming more diverse. Different exhibition venues change the audience's interpretation of the artwork, giving a new meaning to the art experience.

Among these venues, museums are the most important places of experience with their functions of preservation (storage, conservation, restoration, etc.), research (scientific and academic studies, literature, etc.), and communication (exhibition, education, integration with different functions, etc.). While a traditional museum experience is based on a viewing experience limited to the spaces where artworks are exhibited, it has evolved into a new dimension where different presentations and interactions are provided. As a result, museums are rapidly becoming less collection-centered and more community-centered, with a greater emphasis on communication beyond the walls. This makes museums more attractive by extending classical communication and lived experience beyond just physical visits, both turning visitors into users and diversifying participatory experiences (Vermeeren et al., 2018). Thus, instead of hosting a hierarchical and historical exhibition as in classical museology, museums have started to offer environments where communication is at the highest level, not only learning and recognition but also participation-priority experiences, and thereby, museums have turned into visitor/user-oriented living spaces rather than collection-oriented.

Physical Exhibition Spaces, Interaction, and Museums

People participate in an interactive experience when they are physically present in a space and take part in it. Public open spaces such as squares, streets, avenues, outdoor spaces, indoor spaces, and physical

environments such as museums, galleries, and auction venues host this exhibition and the art exhibited is in physical interaction with the user/audience. However, artworks can be sometimes displayed without spatial boundaries, as in the cases of the Berlin Wall (Figure 1a), the graffiti on the John Lennon Wall in Prague (Figure 1b), or the seesaw installation on the Mexican American border wall (Figure 1c), or one can go beyond seeing and interact with an installation (touching, entering, climbing, etc.) (Figures 2a-c). Sometimes, as in the installations "Onde Pixel" (as shown in Figure 3a-b) in Milan and "The Pool" in Lisbon, it can turn into an experience that includes both seeing and hearing through light-color-sound interaction in an enclosed space (as indicated in Figure 3c). Although the places where art is experienced and visitors can access and interact with the artworks vary, such as galleries, exhibition halls, museums, etc., museums have an inclusive content of other places in terms of their history (Aslanoğlu, 2014). It is a common assertion that the practice of architecture is perceived mainly through the sense of sight and therefore tends to neglect the senses of hearing, smell, touch, and taste. On the other hand, the process of perceiving space is not only related to our visual perceptions and their impact on the human visual cortex but also through sound, sensation, and smell. Therefore, while the eye/sight has traditionally dominated the architectural design process, an increasing number of architects and designers, especially in recent years, have focused on the role played by other senses like sound, touch, and smell.

(a) (b) (c)

Figure 1. Examples of art and interaction in physical space - unenclosed spaces: (a) Berlin Wall, (b) John Lennon Wall, (c) Mexican American Border Wall (http #1 – http #2 – http #3)

(a) (b) (c)
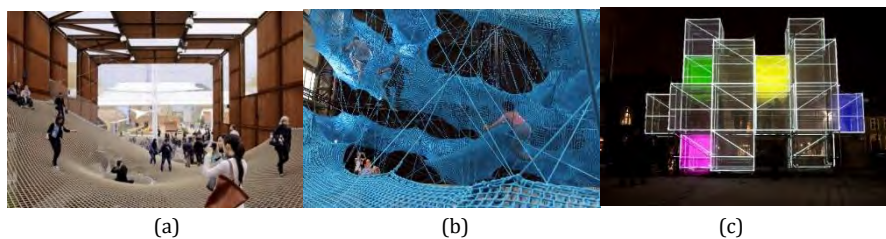
Figure 2. Examples of art and interaction in physical space - Touch-enter-climb installations: (http #4 – http #5 – http #6)
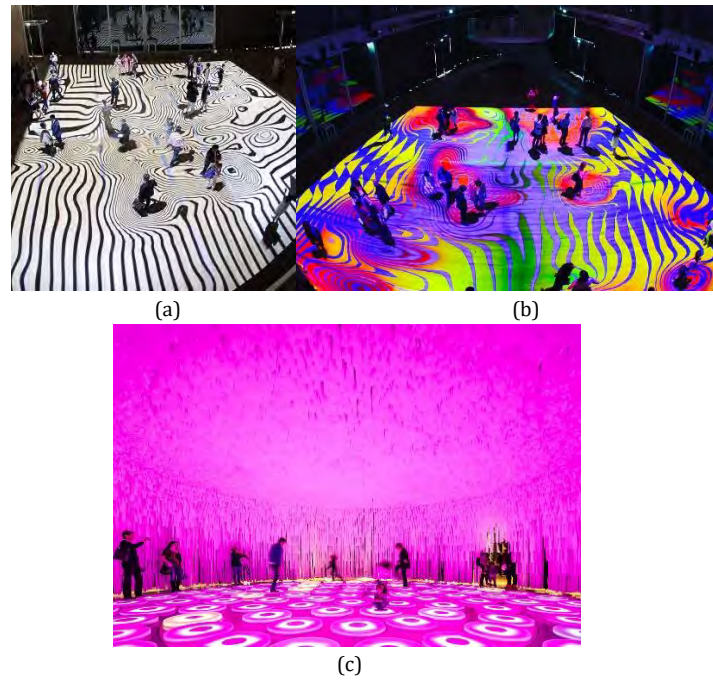
(a)   (b)

(c)

Figure 3. Examples of art and interaction in physical space - light-color-sound interactive artworks:
(a-b) Onde Pixel installation, (c) The Pool installation (http #7 – http #8)

The museum's contact with the space-art-individual creates an intangible concept of 'interaction' and ensures that art is understood in its own place and context. One of the most important factors in providing such an understanding is the interaction with the senses. The senses are specialized forms of skin tissue that allow us to make contact with the outside world (Pallasmaa, 2011). According to Montagu (1986), touch is our first means of communication, our oldest and most sensitive sense. Touch provides a better perception of space by integrating physical experience with visual perceptions. Here, the sense of touch should not be considered directly touching an artwork. Being physically present in a museum space, smelling it, seeing it from every angle, and experiencing it may also mean touching it. This is because all senses, including sight, are extensions of the sense of touch (Pallasmaa, 2011). Therefore, physical interaction with the museum space is achieved by touching it with the cooperation of other senses, especially touching. In this context, this is one of the reasons why museums exist in their traditional physical forms.

The physical experience of a museum takes place in its walkable or visitable spaces. Spaces are perceived not only from certain viewing angles but also from all aspects that an individual wants to experience. The experience during the visit can take place on a specific route depending on the type of exhibition, or it can naturally take place, without any limitation between the visitor and the artwork. The interaction between the visitor and the artwork is realized through the way the work is presented in the place where it is located. In this interaction, although it is not always possible to touch the artworks in the space, perceiving the designs with other senses creates a physical experience. The physical context in which the museum is located, the sounds in this context, the angle of the sunlight coming into the space,

885

the sound of rain, and atmospheric effects such as watching the snow slowly drifting through the opening of a space, or the time of visit (day and night) can cause the individuals to have different experiences in the same space at different times (see **Figure 4**).
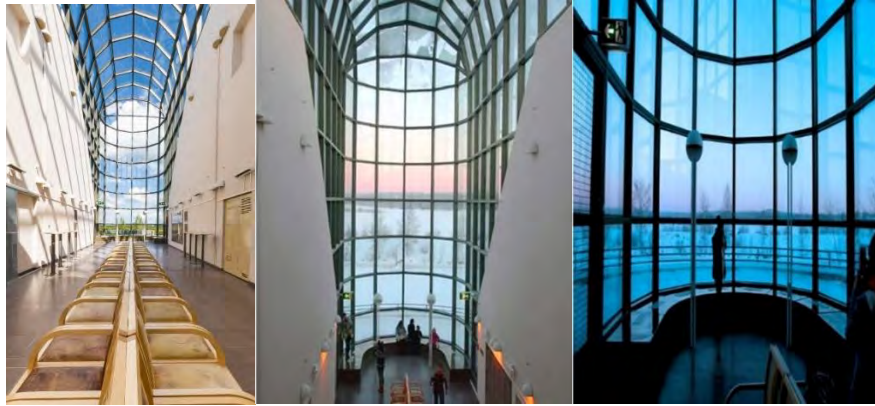

Figure 4. Different weather conditions give physically different experiences to the individual in the same museum space, Arktikum Museum - Finland (http #9)

In addition to the exhibitions where the individual physically interacts with the artworks, some museums allow these exhibitions to be visited in virtual spaces. It is debatable how effective virtual museums are at creating the sensory experience of one-to-one artworks in physical space. It is controversial how effective virtual museums are in creating a sensory experience with one-to-one artwork in a physical space. Therefore, it is not possible for the depictions of artworks in virtual space to exactly replace their depictions in physical space.

Virtual Exhibition Spaces, Interaction, and Museums

Virtual space is a mirror image of physical space. While the harmonic coexistence of the two spaces continues, virtual space is independent of rational conditions such as context and geography (Kerckhove, 2001). Today, museums are one of the sectors that have started to be effective in the use of virtual space. It is possible to create virtual collections where the collection information is stored and preserved virtually, where both the formal and content information of objects are created and recorded, and where any kind of access is possible. The technology-art interaction in these museums transforms museums into an environment where art and technology come together, as technology becomes a part of the museum as well as art (Yılmaz, 2020). In this environment, the dichotomy between authentic (real museum objects) and fake (virtual objects) and virtual activities are discussed by many museum researchers in terms of the real experience versus the virtual experience. While Splidoro (Billock, 2020) considers it a great loss not to have the real experience of seeing an artwork in a physical space, which turns museums into storage areas, Vajda (2020) emphasizes that the "spirit of the place" in real museum spaces cannot be represented in a virtual copy and this spirit cannot be the same in a virtual environment. Govan (Billock, 2020), on the other hand, emphasizes that having everything completely online may be incomplete in terms of virtual accessibility and that the design and spatial use of museums

should be transformed by introducing a hybrid solution. On the other hand, the virtualization of museum interiors and exhibitions can be described as a milestone in the elimination/fragmentation of the traditional, and new museum forms welcome visitors with names such as the digital museum, online museum, electronic museum, virtual museum, web museum, which are also used in this article (Holdgaard, 2021).

Around the world, museums and their activities at all levels have been severely affected by the pandemic, and strict hygiene protocols to keep both visitors and staff safe have reduced visitor/user numbers and made alternative forms of museums more attractive. According to a study by the European Network of Museum Organizations on the impact of the COVID-19 pandemic on museums in Europe, over 70% of these museums remained closed to the public for the duration of the study without a firm reopening date, and even a second mandatory closure of museums was decided without consultation despite existing and well-functioning hygiene protocols. However, the study also emphasized that the closure decision was not influenced by the fact that no cases of COVID-19 contamination were recorded among the visitors to the museums in Europe in the post-pandemic period. According to the study, museums lose 25-75% or even more visitors upon reopening after their first closure, and the main reasons for this dramatic decline include the decrease in the global tourism movement (73%), the termination of both school programs (64%) and social aid and society programs (50%), and increased security protocols that generally allow limited numbers of visitors (Network of European Museum of the Organisation, 2021).

Despite such unprecedented impacts of COVID-19, museums have been quick to react to the pandemic and have begun to implement creative solutions to reach their audiences. In this regard, the Virtual Public Square, focusing on disseminating information specific to cultural programming, human rights, and communication techniques, is a communication platform created for this purpose. It also aimed to lay the groundwork for actions related to COVID-19 and create a platform for members to come together and share their experiences (http10). Moreover, many museums, which could be visited virtually even before the pandemic, have increased the number of such 'museums without walls' (Vajda, 2020) by developing and opening their virtual events during the stay-at-home periods. Museums, diversifying their virtual art tours in line with the transformations they have experienced, have helped to reduce isolation and loneliness through virtual services by giving remote access to people staying at home. They also continued their extensive educational role remotely, providing quizzes, games, and educational materials alongside online exhibitions. The museums' starting to provide online services and the increase in their existing online services were also reflected in the research conducted by the European Museum Organizations Network. It was reported that online

887

services increased by 93% and museum social media activities by 75%. According to the research, 53% of museums either started creating video content or increased their video content (Network of European Museum Organization, 2021).

Undoubtedly, social media has played a major role in increasing the rate of participation in events in this process (ICOM, 2020; Interreg Europe, 2020). Therefore, new museum forms, online services, social media activities, virtual exhibitions, etc. created in an effort to increase the number of visitors along with the content, have begun to change the spatial perceptions of the visitors, leading to the transformation of the experience of interacting with exhibitions and artworks in museums. During the COVID-19 pandemic, while the great disconnect with physical space, albeit not permanent, caused a lack of cultural, contextual features and spirit of the place, the increasing presence of virtual tours and the opening of a museum online in any country in the world has become inclusive for every individual who cannot physically access that place.

Universal Accessibility of Interactive Art in Virtual Museum Environments in the COVID-19 Period

The COVID-19 pandemic started in 2019 has negatively affected many areas from education to transportation, from production to consumption, and from economy to tourism, together with the field of health. The new normalization seen in many places in daily life has also affected cultural participation, starting to change the way art spaces such as museums are experienced through physical interaction. The act of touch, which gained an unsettling characteristic with the pandemic, led to the closure of museums as physical spaces, which are generally not considered mandatory in daily life. This situation has already begun to change the role of culture and museums in our society. Restrictions on social distance, like many other institutions around the world, have raised the question of how to redefine ties to art and culture (Merritt, 2020; Tallant, 2020).

In this unnatural period for museums, communication and interaction with artworks became less physical and more virtual. Making physical spaces inaccessible, eliminating museum-hosted events, organizing new exhibitions, and attempting to contextualize them virtually can be considered a different and unusual form. While this situation led to a change in quantitative and qualitative expressions, boundaries disappeared for the exhibition area and exhibition halls expanding in the space, and the space now started to consist of 'homepages' (Vajda, 2020).

RESULTS

Cultural spaces have a responsibility to welcome everyone inclusively as a service to the public. Although access to cultural heritage has been declared as an official right, this idea is still not fully mature

worldwide. (Partarakis, et al. 2016). Each user gets a unique experience in the online virtual art process. The range of possible inclusiveness of activities is directly related to how effectively websites build their designs considering various user groups.

Under normal circumstances, user groups can be more easily guided spatially using methods such as material differences on the floor, signage, embossed Braille, and voice guidance systems in the name of inclusiveness and accessibility in a physical museum visit (Kiessner, 2020). In addition, activities such as attending or participating in interactive exhibitions and learning during physical museum visits also provide users with a variety of experiences. The existence of solutions that appeal to different user groups in the virtual process is controversial. In virtual museums, it is important to easily include different user groups in the web environment, as in the physical museum experience, and to provide accessible processes in the physical experience. Having options for hearing-impaired user groups such as written information elements/buttons/mouse gestures, guiding signs/shapes, information texts, and sign language translators will make a museum's web page easily accessible for such user groups. Likewise, the web pages of virtual museums must produce solutions for another special user group, the visually impaired. To make screen notifications more accessible to this user group, the necessary software and hardware should be developed to enable collaborative integration. Another important feature is depictions and/or representations of space and artworks. An important detail in these explanations is the automatic addition of alternative text to the database from which the content is generated (EGED, 2020).

To the best of the researcher's knowledge, when compared to the increased activity and use of social media on the online web pages of museums around the world after the COVID-19 pandemic, no such information has been found on the web pages of museums in Turkey. Accordingly, this study discusses the accessibility of virtual museums in Turkey for different user groups. According to the data from the Culture and Tourism Association and the General Directorate of Cultural Heritage and Museums, 59 museums across Turkey, excluding open-air museums, ruins, and ancient theaters, offer virtual tours to web users (http11, http12). The accessibility levels in the museums examined within the scope of the research are classified in Table 1 according to the presence of the following features that can enable the user to better perceive the space and artworks:

- Architectural plans
- Axonometric view
- Information buttons
- Action buttons
- 360o space experience
- Visual support
- Auditory support

- Video support
- Ability to measure the dimensions of space and artwork.

Table.1 Accessibility-based classification of virtual museums in Turkey (the name given in the parenthesis at the end of each museum's name is the city name in which the museum is settled)

#	Museums	A Architectural plan	B Axonometric view	C Information buttons	D Action buttons	E 360° space experience	F Visual support	G Auditory support	H Video support	I Measure size
1	Adana Etnography Museum (Adana)	X		X	X	X	X			
2	Alanya Castle Museum (Antalya)				X	X				
3	Anamur Museum (Mersin)				X	X				
4	Anıtkabir (Atatürk's Mausoleum) Museum (Ankara)				X	X				
5	Ankara Art and Sculpture Museum (Ankara)				X	X				
6	Ankara Castle Museum (Ankara)				X	X				
7	Ankara Etnography Museum (Ankara)	X			X	X	X			
8	Ankara Turkish Gendarmerie Museum				X	X				
9	Antalya Archaeology Museum (Antalya)	X		X	X	X	X			
10	Antalya Museum (Antalya)				X	X				
11	Ayasofya (Hagia Sophia) Museum (İstanbul)					X				
12	Beylerbeyi Palace Museum (İstanbul)					X				
13	Bimarhane Amasya Museum (Amasya)					X				
14	Bodrum Museum of Underwater Archeology (Muğla)				X	X				
15	Burdur Archaeology Museum (Burdur)					X				
16	Bursa Foundation Culture Museum (Bursa)	X		X	X	X	X	X	X	
17	Cappadocia Dark Church Museum (Nevşehir)					X				
18	Chora Museum (İstanbul)					X				
19	Çanakkale Namazgah Fort and Museum (Çanakkale)					X				
20	Çorum Boğazköy Museum (Çorum)					X	X			
21	Çorum Museum (Çorum)	X		X	X	X	X			
22	Çinili Köşk Archaeology Museum (İstanbul)					X				
23	Derinkuyu Underground City Museum (Nevşehir)				X	X				
24	Dolmabahçe Palace Museum (İstanbul)					X				
25	Edirne Museum (Edirne)					X				
26	Ephesus Museum (İzmir)					X				
27	Galata Mevlevi Lodge Museum (İstanbul)					X				
28	Gazi Museum (Samsun)	X		X	X	X	X			
29	Gaziantep Museum of Archaelogy (Gaziantep)	X			X	X				
30	Göbeklitepe Museum (Şanlıurfa)					X				
31	Hatay Archaeology Museum (Hatay)					X				
32	Industry and Technology Museum (Ankara)					X				
33	Intangible Culturual Heritage Museum (Ankara)					X	X			
34	İbrahim Hakkı Hz. Museum (Siirt)					X				
35	İst. Kız Kulesi (Maiden's Tower) Museum (İstanbul)					X				
36	İstanbul Museum of Modern Art (İstanbul)	X	X			X	X			
37	İstanbul Toy Museum (İstanbul)	X				X				
38	İznik Museum (Bursa)					X				
39	Konuralp Museum (Düzce)				X	X				
40	Mardin Museum (Mardin)					X				
41	Memory 15 July Museum (İstanbul)					X				
42	Mevlâna Museum (Konya)				X	X				
43	Miniature Museum of Amasya (Amasya)					X				
44	Mudurnu City Museum (Bolu)				X	X				
45	Muğla Museum (Muğla)				X	X				
46	Museum of Anatolian Civilizations (Ankara)					X				
47	Museum of Republic (Ankara)	X	X	X	X	X	X			
48	Museum of the War of Independence (Ankara)	X		X	X	X	X			

890

		A	B	C	D	E	F	G	H	I
49	Museum of Troy (Çanakkale)	■	■	■	■	■	■			
50	Panorama 1453 History Museum (İstanbul)					■				
51	Pera Museum (İstanbul)	■	■	■	■	■	■			■
52	Rahmi M. Koç Museum (İstanbul)		■		■					
53	Odunpazarı Modern Museum (Eskişehir)	■	■	■	■					
54	Sakıp Sabancı Museum (İstanbul)				■					
55	Side Museum (Antalya)				■					
56	Topkapı Palace Museum (İstanbul)				■					
57	Turkish Islamic Arts Museum (İstanbul)				■					
58	Yörük Ali Efe Museum (Aydın)					■				
59	Zeugma Mosaic Museum (Gaziantep)	■		■	■	■	■			

In the present study, 59 museums providing virtual space services in Turkey were examined in terms of their qualifications and categorized into 6 different classes from 1 (low access) to 6 (high access) according to their accessibility level. This distinction was based on the thresholds determined according to the inclusiveness of the museums examined in the research and the accessibility solutions they offer virtually.

Accordingly, Table 1 shows Architectural plan(A), Axonometric view(B), Information buttons(C), Action buttons(D), 360° space experience(E), Visual support(F), Auditory support(G), Video support(H) and Measure size(I) properties are marked. The examined virtual museums do not have all A, B, C, D, E, F, G, H, I properties at the same time. In this context, 59 virtual museums examined were divided into 6 groups due to their A, B, C, D, E, F, G, H, I characteristics. And as museums have any of these features, their accessibility increases. Accessibility features increase from group 1 to group 6 for users (as can be seen in Figure 5). The categorization of 59 museums with different spatial accessibility characteristics is presented in Figure 6 according to their spatial classes given in Figure 5, which were formed based on the criteria presented in Table 1.
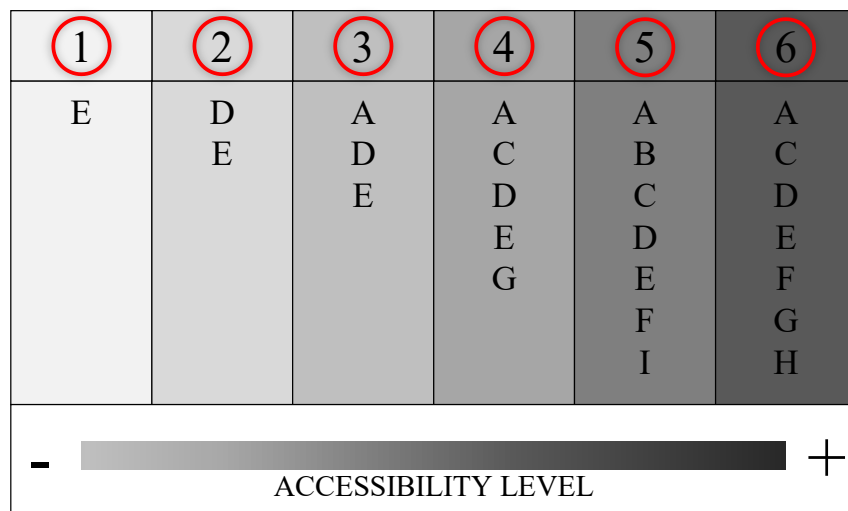
1	2	3	4	5	6
E	D E	A D E	A C D E G	A B C D E F I	A C D E F G H

ACCESSIBILITY LEVEL

Figure 5. Classification of virtual museums in Turkey by spatial characteristics

1	2		3	4	5	6
11	2	32	37	1	28	16
12	3	33	52	7	36	
13	4	34		9	47	
22	5	35		20	48	
24	6	39		21	49	
27	8	40		28	51	
38	10	41		29	53	
43	14	42		59		
50	15	44				
58	17	45				
	18	46				
	19	54				
	23	55				
	25	56				
	26	57				
	30					
	31					

− ●●●●●●●●●●●●●●●●●●●●●●●●●●●●●● +
ACCESSIBILITY LEVEL
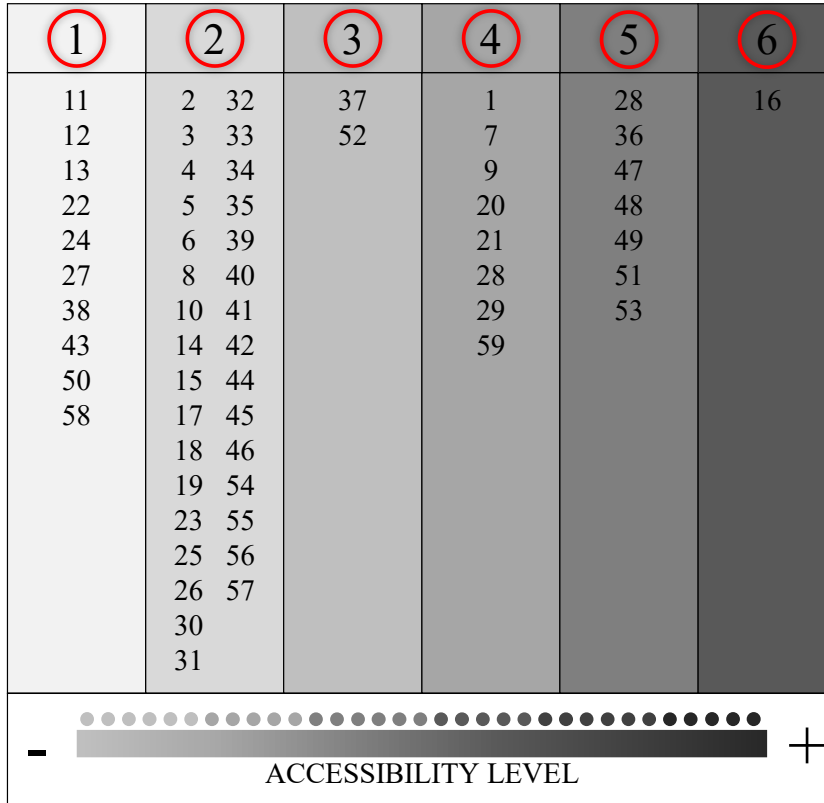
Figure 6. Spatial characteristics-based classification of virtual museums in Turkey

Although the first group of museums does not provide an online service, the web page offers the option to download a file that provides a 360-degree experience of the venue. There is no orientation during the visual interactive experience and space options are very limited (see Figure 7). Therefore, this does not create appropriate solutions for the hearing and the visually impaired.

Figure 7. The first group museums (specified in Figure 6) – 360-degree experience in Dolmabahçe Palace interior

The second group of museums offers a variety of venues with outdoor options around the museum in the online service they provide. The spaces are numbered without specifying a floor plan. The web page is experienced in the space that opens without progressing in any order. Therefore, this situation causes users to experience a lack of perception

of where they are in the museum. Users move through the museum using the arrow keys that appear on the screen after double-clicking on the screen with the mouse. Users can also zoom in and out of the space with the mouse scroll wheel and the + and - buttons on the screen (as shown in Figures 8a-b). However, this situation does not generate appropriate solutions for the hearing and the visually impaired.

(a)
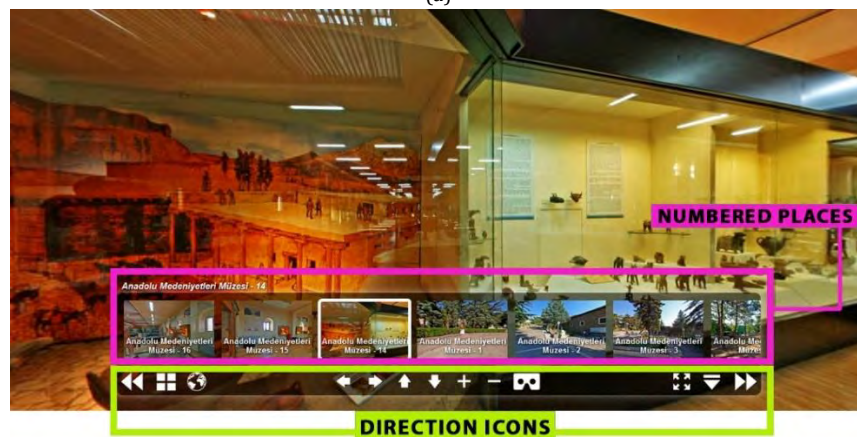
(b)

Figure 8. The second group museums (specified in Figure 6) –Anadolu Medeniyetler Museum virtual space analysis: (a) exterior analysis, (b) interior analysis.

The third group of museums is architecturally more positive in terms of guiding the user by giving information about the floor plan of the museum. As in the second group of museums, there are arrow keys that appear in front of the space when the mouse is double-clicked on the screen while moving around the museum, and on-screen buttons that allow you to zoom in and out to a certain extent (see Figure 9). However, space-defining features, which have increased compared to other groups, still do not offer appropriate solutions for the hearing and the visually impaired.
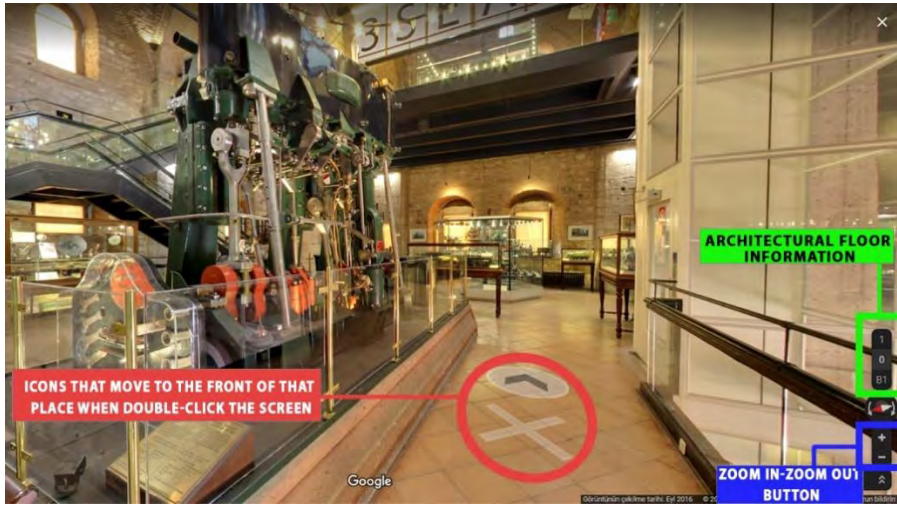
Figure 9. The third group museums (see Figure 6) – virtual space analysis of Rahmi Koç Museum

The fourth group of museums begins with the entrance area outside the museum, and henceforth, the screen shows the architectural floor information. There are keys to orient the screen for the users, a sound option (no information on its active use was found), and dedicated place buttons to navigate between the main places, apart from the architectural floor information. There are information boxes at some points in the interior. In addition, certain points can be reached by moving back and forth in the space, and double-clicking on the screen provides the user with arrows leading to that space (**Figure 10a-b**). However, museums belonging to this group also do not offer appropriate solutions for the hearing and the visually impaired.

894
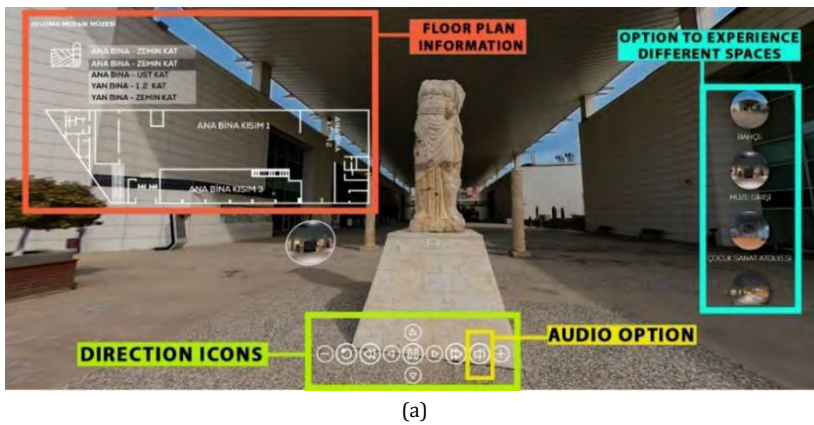
(a)

(b)

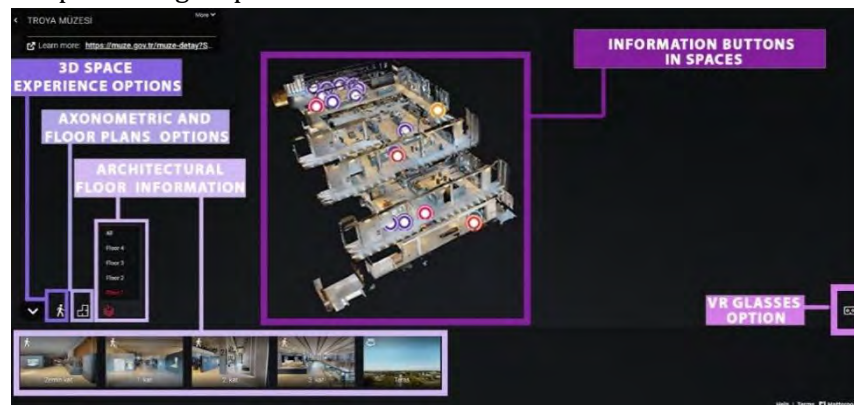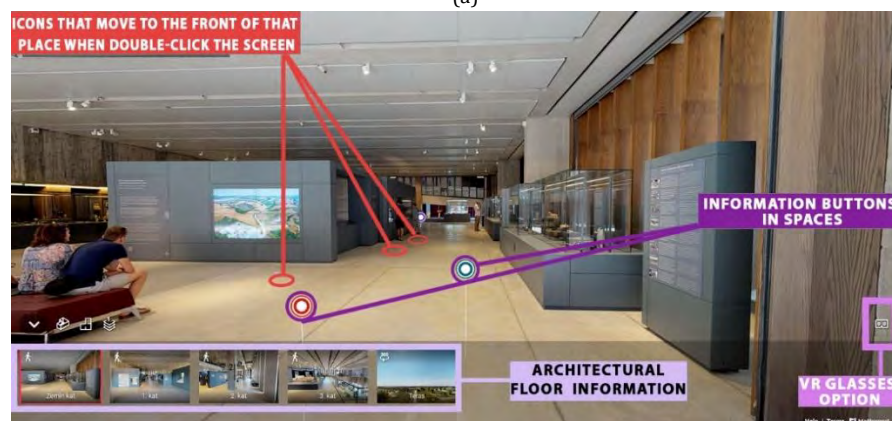**Figure 10.** The fourth group museums (see Figure 6) – virtual space analysis of Zeugma Mosaic Museum: (a) exterior analysis, (b) interior analysis.

The fifth group of museums is more successful not only in the transition between architectural floor plans but also in allowing users to perceive the space with both floor plans and axonometric view options. In this group of museums, there is the option to walk around the museum in 3D, as well as the option to examine it only on the plan plane. The information boxes in the interior, the VR glasses option, the 360-degree interiors, and the terrace floor make Troya Museum that was awarded the "European Museum of the Year" award, one of the longest-running and most prestigious museum awards given annually by the European Museum Forum (EMF) under the auspices of the Council of Europe in 2020 stand out among the virtual museums compared to previous groups (as can be seen in Figures 11a-b). In this context, the "Troya Museum" with its brilliant architecture representing the perception of time through the relationship of light and shadow, and its innovative exhibition that combines contemporary issues with history and asks universal questions about the meaning of war, continues to exist robustly in virtual space (T.R. Ministry of Culture and Tourism, 2021). However, the extent to which it offers universal access to hearing and visually impaired users is controversial, as it has been for the previous groups of museums studied so far.

(a)

(b)

Figure 11. The fifth group museums (see Figure 6) – virtual space analysis of Troya Museum: (a) analysis of the virtual options that the museum has, (b) interior analysis.

Bursa Foundation Culture Museum, which is in the sixth group of museums, has deficiencies like all other museum groups, but it is more successful in terms of inclusiveness, accessibility, and universality. The museum offers the user the opportunity to navigate by providing only spatial information without providing information about the

895

architectural floor plan. Space options are accessed by an arrow on the left side of the screen. Information boxes in the space provide information about the artworks. Information in the museum is provided not only through visual content but also through video support. However, this is the first museum with the video-audio guide option, which is not available in the other museums presented herein. The guide does not provide support everywhere, but it is activated by clicking on the screen with the mouse at certain points (see Figures 12a-c). While these features are positive for the hearing-impaired user group, providing an option for the visually impaired user group to experience the space and artworks is controversial, as in previous museum groups examined so far.

(a)

(b)

(c)

Figure 12. The sixth group museums (see Figure 6) – virtual space analysis of Bursa Foundation Culture Museum-1: (a),(b),(c) interior analysis.
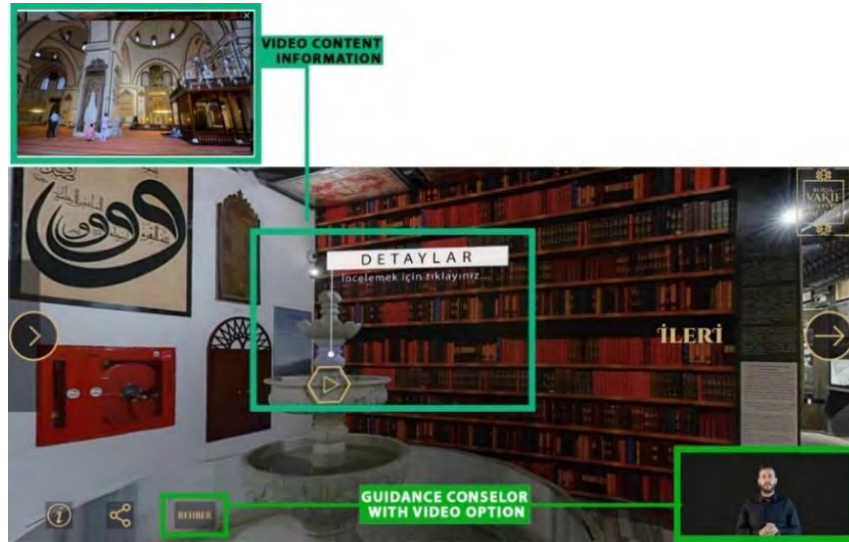
Today, museums can be visited online and virtually, changing users' experiences with physical space and differentiating their interactions with space. Since the individual physically interacts with the museum space with all of her/his senses, she/he perceives the space in a virtual space with often visual and rarely auditory senses. In this context, when the 59 museums examined in the study are proportioned according to the accessibility level, it can be stated that only 1 of the 59 museums (museum group 6, Bursa Foundation Culture Museum) is more positive than the other groups, although it does not fully meet desired accessibility levels.

Figure 13. The number of virtual museums in the museum group is determined according to accessibility classification in Turkey.
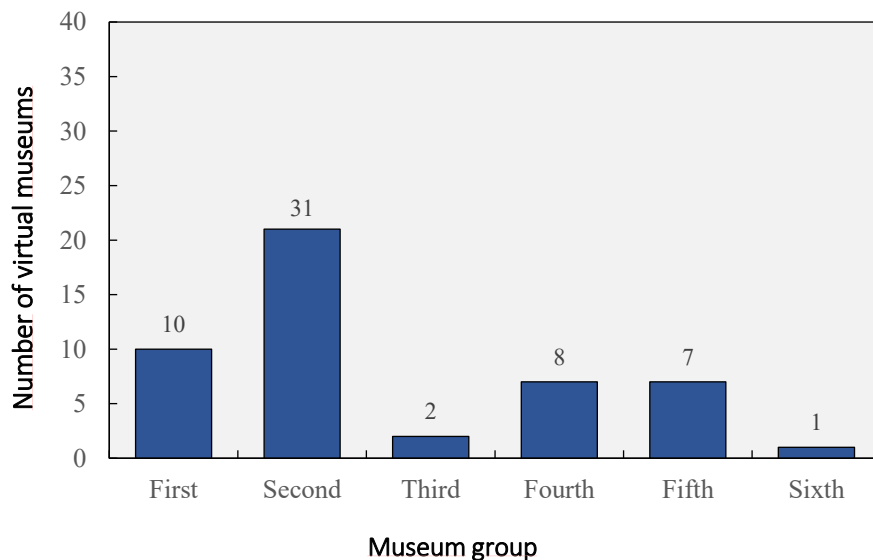
The museum groups examined within the scope of the study have several shortcomings in terms of universal accessibility. As can be seen in Figure 13, 10 of the total museums included in this study are in the first group, while 2 museums are in the third group, 7 museums each are in the fourth and fifth groups, and 1 museum is in the sixth group. Among the museums analyzed in this study, the second group with 31 museums has the highest number of museums. At this point, it is very

important to develop websites that are inclusive of everyone, regardless of their abilities, characteristics, and disabilities (Henry et al., 2014). Web accessibility should be universal for all users, not just those with disabilities. Because "an accessible web is a unique information and communication resource!" (Yeşilada, 2019). In this direction, some aspects of the virtual accessibility of museum spaces need to be improved. Especially with the increasing value of virtual technologies during the COVID-19 pandemic, museums, museums should offer more interactive experiences to users in virtual spaces like they do in physical spaces. The examined virtual museum spaces have different deficiencies in addition to positive features. In this way, web pages need specific solutions to make museum spaces and artworks more inclusive, perceivable, interactive, universal, and generally accessible:

- Descriptive floor plans
- Axonometric planes
- Explanatory information buttons
- Buttons that will allow you to move comfortably in the spaces
- 360o space experience
- Audio guide
- Subtitle-supported guide
- Visual supports
- Video supports
- Color arrangements
- Simulations
- Augmented reality systems (Augmented Reality)
- Virtual reality systems (Virtual Reality)
- Ability to measure the dimensions of space and artwork.

Museums fundamentally require a physical connection-communication interaction with spaces and artworks. In virtual museum tours, the spaces are clear, and anyone can experience the space presented to the user in a unique way. The solutions specified in the study, on the other hand, will make the online museum more accessible for users to perceive and experience the space. Solutions to make online museums more accessible and universal for users will make the audiences more engaged with art. Web accessibility needs to be enhanced to increase the universal accessibility, attractiveness, and interactivity of museums and to improve the visitor experience using innovative virtual solutions. The increase of virtual tours and the online serving of a museum in any country in the world has made it accessible to anyone who cannot physically visit that place.

CONCLUSION

The concept of accessibility has evolved over the years; originally it was about removing architectural barriers in a physical space, mainly for wheelchair users and later about the disabled. However, today meaning covers the spectrum of human integration, because at some point in life all people can have limitations. In this context, discussing

the accessibility of a virtual space is also included in this inclusive spectrum (Rojas et. Al., 2020). Users surely have different experiences when viewing artworks in a physical or virtual museum. Visitors' perceptions of space have started to change as they use the new museum forms and spaces that have become increasingly widespread with COVID-19. While these changes cause deficiencies in terms of cultural, contextual, sensory characteristics, and spirit of the place, the increasing presence of virtual tours has become a gain in terms of accessibility. The notion of accessibility emphasized here covers more than just disabled individuals.

In general, the pandemic period can be said to be a period of respite for museums to redesign themselves and examine their ideas on virtualization. Can the user, nevertheless, be a participant in this virtual process in terms of accessibility? It is also essential to ask this question.

It is, therefore, necessary to evaluate the advantages and disadvantages of physical and virtual exhibitions in terms of universal accessibility:

• There are differences between an exhibition in a physical space and an exhibition in a virtual space. While a physical exhibition is connected to the space, virtual exhibitions are related to this virtual place, but this relationship is weaker.

• Virtual exhibitions can be made more accessible, but there is something ritualized about the physical exhibition. While the physical exhibition is situated in a space or context, the virtual exhibition is more fictional on the spatial plane, even though it can provide a visual circulation in the interior of the existing building.

• A virtual exhibition is as authentic as a screen, while a physical exhibition is as unique as its context.

• Physical exhibits are an important aspect of museum culture. In this culture, it is possible to interact with people, souvenirs, posters, etc. even without buying a ticket. There are many situations, from eating to having coffee or taking a break. These situations can also be found in virtual exhibitions, tickets can be purchased from anywhere that can be accessed electronically without physically standing in a queue. People can take advantage of online support even if people are not in contact, but it is not possible to feel the spirit of the space in the same way as in the physical space.

• In order for the physical space of museums to be inclusive, it must fulfill certain mandatory conditions for different types of users. Spaces designed with the orthopedically handicapped, hearing impaired, and visually impaired in mind are important for ensuring universal accessibility.

• Virtualization of museums can be advantageous in terms of accessibility, but the extent of this accessibility requires technological contributions.

899

• Museums are venues of cultural representation. The simultaneous accessibility of both physical and virtual space will universalize the experience of this representation.

Therefore, as we approach a new era with new pros and cons, it is essential to create a novel form of balance. Since museums have a responsibility to hold a mirror up to society, new ways of experiencing art are needed. In the period when physical access to most art institutions is restricted due to the pandemic, new solutions for exhibition spaces are needed. However, museums have an obligation to be inclusive and make virtual activities more accessible to different user groups, while doing this. It is thought that this obligation can be achieved by updating the articles in the United Nations Convention on the Rights of Persons with Disabilities. In this direction, new articles can be added to Article 20 of the UN Convention on the Rights of Persons with Disabilities, Personal Mobility, to facilitate access to web mobility as content. Furthermore, Article 30 of the UN Convention on the Rights of Persons with Disabilities on Participation in Cultural Life could be updated by adding access provisions to web mobility.

In conclusion making museums, which are the pioneers of cultural heritage, accessible is very important in virtual space as well as in physical space (Lisney, et. Al.,2013). Rather than being a target, technology should be a tool that engages users and gives them access to space and artwork. Museums should no longer be limited to a narrow audience but should appeal to a wider audience by making their exhibits more accessible in virtual spaces. Respecting diversity and different user groups, finding common ground through art, and making it more accessible by producing both physically and virtually solutions will play an important role in the improvement needed in the coming days.

900

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901

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902

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903

Research Article

Green Building Assessment Model for Historic Buildings of Turkey

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Abstract

Grave structures are architectural works reflecting the cultural accumulation, continuity and political power of societies. In the context of sustainability, while "green building" certification systems are developing in building productions in the world, new guidelines are also being created. Of course, new guidelines are also being developed on the certification as green buildings within the scope of the protection and restoration of historical buildings that should be specially considered. In this study, it is aimed to create a model that will allow the historical buildings in Turkey to be evaluated in the context of "the green building" concept. With this model, it is considered that historical building conservation practices will contribute positively to the works of restorers in making those heritage sites more environmentally friendly and sustainable.

For the model designed to evaluate historical buildings within the scope of green buildings, historical buildings were handled under 3 groups: a) 1st Group Historical Buildings, b) 2nd Group Historical Buildings and c) Reconstructed Historical Buildings. As creating the designed model, GBC-Italy system criteria were taken as the basis. The criteria were carried out by conducting a questionnaire with experts in this field. Importance of the relevant evaluation criteria in the scoring system were determined by using the AHP method. As a result of the analyzes and calculations, the accuracy of the scoring was confirmed. As historical buildings are evaluated according to the conditions of their periods, it is obvious that they are sustainable buildings. Naturally, nowadays to be able to preserve historical buildings for the future generations in a proper way is usually ensured by giving them a new function. The requirements of the new functions given to create the necessary equipment to provide today's comfort conditions in historical buildings naturally change the sustainable characteristics of the historical heritage. This evaluation system, designed to preserve the green building characteristics of historical buildings and to ensure their sustainability with their new functions, will be an important guide.

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INTRODUCTION

In recent years, with the energy and resource crises experienced in the world, the construction industry has entered a new period of change. The reason for this is that buildings have a large share in energy consumption in the world. Today, the changing comfort conditions and the increase in technological devices that require energy use cause an increase in the amount of energy used in buildings. The uncontrolled consumption of fossil energy sources and other natural resources used in the construction and operational period of buildings creates great destruction in nature, increases environmental pollution, and causes global warming. In this context, in the buildings various strategies that aim to reduce energy, resource consumption and the negative effects of the building on the environment have been developed. Of them, sustainability strategy comes first. Ensuring the sustainability of buildings, built environment, and ecological environment are the main objectives of sustainable architecture.

Özkeresteci (2001) defined "sustainable architecture" as an approach that considers the relationship between human and nature, accepts climatic and topographic data as an indispensable preliminary data package and strives to use resources sparingly.

As a result of sustainable architectural research, various ideas and practices have emerged, of which the most striking and impressive is undoubtedly the "Green Building" discourse. The concept of green building has been rapidly accepted by the relevant circles from the day it emerged and has become widespread by developing. It has been foreseen that the new buildings built in the "Green Building" concept will consume less energy and resources than the existing buildings, and strategies have been developed accordingly. As developing sustainable architecture and green building strategies, new buildings have been the priority, but as stated by experts, the existing building stock is also an important area that should be evaluated in this context. Whereas, in this context within the existing building stock, historical buildings need completely customized strategies. However, the sustainability of the implementations made to historical buildings in line with traditional conservation approaches is discussed. Although it is important to ensure the sustainability of historical buildings by using them, it is necessary for the applications chosen for the historical building to contribute to their sustainability.

Approaches to the conservation of historical buildings continue to develop and today sustainability has become the main parameter in this field (Boarin, Guglielmino, Pisello, & Cotana, 2014). In this context, green building evaluation systems also develop new practices for historical buildings (Appleby, 2012).

As considered within the scope of green building evaluation systems, it has emerged that historical buildings should be handled differently from other existing buildings. International green building assessment systems have created guidelines that will allow historical buildings to be

evaluated in this context. With these guidelines, it is aimed that historical building preservation approaches support environmentally friendly practices and that green building practices are used in applications for the protection of historical buildings.

The conservation and reusing of historical buildings is a sustainable practice. While the principles of protection and repair ensure the continuity of the buildings, minimizing their environmental effects has become an important parameter. By reusing a historical building, the entire building is recycled, thus reducing the demand for natural resources to be used to construct a new building and saving energy for demolition and new construction. By preventing the destruction of the historical structure, the wastes arising from this process are prevented. At a time when climate change and depletion of natural resources remain current, the environmental benefits of reusing historical buildings cannot be ignored. For this reason, environmentally friendly building production studies, which started with the emergence of the concept of sustainability in the construction sector in recent years, were evaluated and the examples of green building evaluation systems in the world were examined. Among those systems, the approaches of LEED, BREEAM, and GBC-Italy evaluation systems within the scope of historical structure were examined. In recent years although green building evaluation works are carried out in Turkey, there is no specific certification system for historical buildings yet.

In our country, studies are carried out towards reducing the negative effects of historical building preservation processes on the environment, but it is known that we are far behind in this area when compared to European countries. To ensure energy efficiency, sustainability and protection of cultural heritage, there is a need for a green building evaluation system specific to historical buildings by combining the criteria to be determined within the framework of the standards related to the national historical building rating system and documents on conservation practices. It is expected that the evaluation system to be created will have the characteristics of being a guide in ensuring sustainability in historical building conservation implementations.

HISTORICAL BUILDING ASSESSMENT STRATEGIES FOR GREEN BUILDING CERTIFICATION SYSTEMS

Historical buildings connect with the past by revealing how societies have developed socially, technologically, and culturally. While some historical buildings preserve their original functions after the conservation implementation, some are adapted to new functions out of necessity. Unfortunately, together with rapid population growth and urbanization generally, in the world, most historic structures are increasingly threatened by demolition. However, with the conservation approaches developed under the leadership of countries such as the USA, Australia, England, and Italy, they maintain their existence by ensuring that historical buildings largely preserve their environmentally

sustainable characteristics (Eldek, 2014). In other words, it is ensured that historical buildings are reused by preserving their historical values with environmentally friendly sustainable conservation implementations.

Historical buildings mean much more than a mass formed by the combination of building elements. With their designs, textures, construction types, sizes, shapes, locations on the land, environmental landscapes, and climatic features, they are the assets that provide evidence for the place of a whole mechanism in history, the progress of technology, and the development of art. In this context, a successful reuse application can be ensured by the complete and holistic preservation of the characteristics of the historical building (Hamilton, 2012). As Mouzon (2010) remarked, "Conservation is an ongoing act of sustainability."

There are numerous reasons why historic building stock is worth reusing. However, historic building preservation also has complex issues. As developing approaches to the conservation of historic buildings there are many restrictions within the scope of the legal framework. These constraints can sometimes cause problems in implementing sustainability strategies. Many of the design techniques used by the green building industry today are the same techniques that have been used over the years, deriving from historical traditions and adapting to the regional climate, such as building orientation, daylight gathering, sun shading, regional materials, natural vegetation, and passive ventilation. Historical buildings built during periods of the absence of today's vehicles are generally located in densely populated areas, easily walkable, and close to many services and usage areas (Magrini, Franco, 2016). Historical buildings have been constructed to be climate responsive, economically and environmentally sound, using durable local materials of their period, with implementations aimed at prolonging their life.

The historical building's sustainability should be evaluated using historical, architectural, aesthetic, and social qualities, among others. In this context, green building evaluation systems have developed various strategies to select the methods applied in the preservation of historical buildings and then to determine the conservation rate of the energy-efficient properties of the historical building.

LEED, one of the two most widely used rating systems in the world, has not yet created a rating system specifically designed for the renovation and adaptation of historical buildings to their new function. Instead, to certified historic structures, existing LEED rating guides such as LEED New Building (LEED-NC) or LEED 2009 (Existing Building: LEED-EBOM (LEED for Existing Buildings: Operations & Maintenance) have been used, depending on the type and extent of renovation or conservation. However, in larger urban applications involving the reuse of historical buildings, the LEED-ND (LEED for Neighborhood Development) evaluation guide is used. It is important to identify key

907

categories that can be used to develop a framework for assessing the environmental sustainability of historic buildings. For this reason, workings continuing LEED-NC and LEED-ND, implementations are being carried out.

The green building rating system BREEAM does not have a specific guide for assessing historic buildings. BREEAM guides differ according to the functions of buildings. As evaluating historical buildings, detailed information is considered in the explanation sections of the relevant criteria of the BREEAM system. As the evaluations made according to the BREEAM general guidelines are compared with the evaluations made for historical buildings, it is seen that historical buildings receive lower ratings (Global, 2015). This is because properties such as position, orientation, texture, and form cannot be changed, and other restrictions have existed. This situation is considered reasonable, as there may be further limitations on design options and specific requirements for building appearance due to the characteristics of historic buildings. It is known that conservation implementations for historical buildings perform much better than renovation implementations for other buildings (Yuschak, Yuschak, & Mu, 2016).

Since 2015 Italy has created its own guide based on the LEED rating system GBC "Historic Building". This guide is the first assessment guide for the historical buildings category among the green building rating systems. Due to their cultural and architectural values, historical buildings in Italy are considered as the first most important issues. Improving the performance of existing buildings through conservation practices or operational strategies is a priority determined by the European Community. To achieve this aim, in 2010, the American LEED (Leadership in Energy and Environmental Design) and the Italian GBC (Green Buildings Council) developed a local version of the LEED rating system called "LEED Italia" for historical buildings (Lee, Burnett, 2008). However, LEED Italia, which can be applied to conservation implementations for historic buildings, does not include specific criteria for the sustainable assessment of the historical and cultural aspects of a particular part of the built environment. For this reason, GBC-Italia has developed the "GBC Historic Building" which is a new LEED-based rating system for voluntary certification of the level of sustainability in the preservation, recovery and integration of historic buildings (Lucchi, Boarin, Zuppiroli, 2016). "GBC History Building" has emerged as an innovative tool based on the comparison and merging of two different cultures: the sustainability criteria of the LEED standard and the success of Italy's internationally recognized restoration knowledge and skill.

MATERIAL AND METHOD

Questionnaires were conducted to collect data in the creation of the "Historical Building Green Building Evaluation Model". The target group in the survey was determined as architects, engineers and others who are experts in historical buildings and conservation practices. While it

908

was required from the academic participants to have been done academic work condition on the preservation of historical buildings, whereas it was required from architects and engineers to have been worked condition actively in practice working at least one historical building conservation site.

In the categories in which the criteria of the main target of the survey exist, it consists of questions relative to each other that will allow the determination of the importance levels of the criteria. Due to the model created having many evaluation criteria, as creating the model, it was approved appropriate to use the AHP method, which is one of the multi-criteria decision-making methods. Within the scope of the AHP method, the hierarchical order of the relevant criteria has been determined (Saty, 1994). With the program of "Expert Choice", which will facilitate the application of the AHP method, the survey questions were automatically created in accordance with the AHP method. Due to the large number of green building evaluation criteria and the fact that each criterion in AHP application has comparative questions with other criteria, an intense content was created in the application of the survey. In order to avoid disputes that may arise due to this intensity, it is aimed to answer the survey by experts, especially by conducting face-to-face interviews. Data were collected after a few hours of interviews with each participant on a specified day and time. Then, the data obtained were entered into the data entry platform where the AHP method was applied and evaluated.

The survey was carried out separately for three different application areas of historical building protection. These groups are specialized for structures that require different protection practices;1st Group Historical Buildings, 2nd Group Historical Buildings and Reconstructed Historical Buildings. The aim of this is to determine whether historical buildings differ according to the selected application area within the scope of green building certification systems and to create a separate guide for each. The differences determined in the degree of importance of the criteria are provided for the creation of a specialized scoring system for the three different historical building conservation implementation areas.

AHP Method and Reason for Choosing the Method

There are many reasons why the AHP method is preferred in this work. This method is suitable for priority order of the criteria of the model created and determining their weights within the categories; at the same time, its calculations are easy and understandable, it also checks its consistency within itself, provides the opportunity to progress step by step, and allows the priority determination values to be directly converted into weight values (Kuruüzüm, Atsan, 2001). The AHP program used was implemented using a software called Expert Choice-11. The software in question determines the consistency values by making all the sub-computations within itself.

The Categories of Historic Building Green Building Evaluation Model and its Criteria

The approach applied by the green building evaluation systems to the preservation of historical buildings is basically similar to the general principles of historical building preservation, and it can be said that they constitute a guide suitable for the preservation of historical buildings. The first guide created specifically for historical buildings belongs to the "GBC-Italy" green building rating system. In the model created in this study, the historical building criteria of the GBC-Italy system were primarily examined. "GBC-Italy" has created its own system by using the guidelines and assessment methods of the LEED system as a base. Among green building systems in the world, GBC-Italy is the first and only evaluation system prepared in European norms for historical building evaluation. The criteria established within the scope of this model have been constituted to preserve the historical buildings in accordance with their preferred characteristics. These criteria have been prepared to guide the authorities in determining how green and sustainable the use of green and sustainable practices is during and after the works for the preservation of the historic building.

As a result of the research carried out, the historical building stock in Turkey is experiencing conservation problems in the rapidly developing green building evaluation practices. For this reason, the necessity of creating a model that will enable the evaluation of historical buildings within the scope of the green building evaluation system, has emerged without delay. The designed green building evaluation model should also be planned according to the green building performance criteria in accordance with the country conditions.

910

While determining the criteria of the model in question, especially the criteria in the historical buildings guide of the GBC-Italy system and some remarkable conservation practices and legal regulations in the country were examined one by one. Accordingly, changes have been made in the model prepared to ensure that it complies with the protection principles accepted in the country. As a result of these studies, the suggested categories for the historical green building evaluation model are given in Table 1.

Table 1. Historical Building Green Building Evaluation Categories

No	Categories
1	Historic Value
2	Sustainable Site
3	Water Efficiency
4	Energy and Atmosphere
5	Materials and Resources
6	Indoor Environmental Quality
7	Regional Priority
8	Innovation in Design
9	Health and Safety

For the historical green building evaluation model, international green building evaluation systems were examined, and sub-evaluation criteria were created for each evaluation categories.

Evaluation criteria created are shown in Table 2. Within the scope of this study, the categories and criteria indicated in the table are the criteria that are considered to allow the evaluation of historical building conservation practices in the country. Other criteria are also those applied by the "GBC-Italy Historic Buildings" guide.

Table 2. Historical Building Green Building Evaluation Model Criteria

Historic Value	
Credit 1	Preliminary analysis
Credit 2	Advanced analysis: energy audit
	a) I Level Analysis
	b) Advanced analysis: thermography
	c) Advanced analysis: thermography and thermic conductance
Credit 3	Advanced analysis: diagnostic tests on structures and Structural monitoring
	a) Diagnostic tests on structures
	b) Diagnostic tests on structures and structural monitoring
Credit 4	Project reversibility
Credit 5	Querying the conservation application a) Compliance with the intended use and settlement benefit b) Structural similarity with the existing structure
	a) Compliance with the intended use and settlement benefit b) Structural similarity with the existing structure
	c) Diagnostic tests on materials and degradation
Credit 6	Sustainable restoration site
Credit 7	Scheduled maintenance plan
Credit 8	Specialist in restoration of architectural heritage and landscape
Sustainable Sites	
Credit 1	Construction activity pollution prevention
Credit2	Brownfield redevelopment
Credit3	Alternative transportation
	a) Alternative transportation: public transportation access
	b) Alternative transportation: bicycle storage and changing rooms
	c) Alternative transportation: low-emitting and fuel-efficient vehicles
	d) Alternative transportation: parking capacity
Credit4	Site development: open spaces recovery
Credit5	Stormwater design: quantity and quality control
Credit6	Heat island effect: non-roof and roof
Credit7	Light pollution reduction

911

Water Management	
Credit1	Water use reduction
Credit2	Water efficient landscaping
Credit3	Water metering
Credit4	High efficiency appliances and process water systems 1
Energy and Atmosphere	
Credit1	Fundamental commissioning of building energy systems
Credit2	Minimum energy performance
Credit3	Fundamental refrigerant management
Credit4	Optimize energy performance
	a) Calculation of building energy performance
	b) Energy simulation of building internal dynamics
Credit5	Renewable energies
Credit6	Enhanced commissioning
Credit7	Use of automatic systems
Materials and Resources	
Credit1	Storage and collection of recyclables
Credit2	Demolition and construction waste management
Credit3	Maintenance of load-bearing systems and non-structural elements
Credit4	Building reuse:
	a) To be used in its main function
	b) The new function does not require structural changes
	c) The selection of the new function must be in accordance with the characteristics of the structure
Credit5	Materials reuse
Credit6	Environmental impact optimization of the material used.
Credit7	Material extracted, processed, and produced within a limited distance.
Credit8	Use of Local Materials
Indoor Environmental Quality	
Credit1	Minimum indoor air quality performance (IAQ)
Credit2	Environmental Tobacco Smoke (ETS) control
Credit3	Air monitoring
Credit4	Outdoor air delivery monitoring
Credit5	Construction IAQ management plan
Credit6	Low-emitting materials
	a) Low-emitting materials: adhesives and sealants
	b) Low-emitting materials: paints and coatings
	c) Low-emitting materials: flooring systems
	d) Low-emitting materials: composite wood and agrifiber products
Credit7	Indoor chemical and pollutant source control
Credit8	Management and control of systems:
	Visual comfort
	a) Lighting - Light Quality
	b) Lighting System Control
	Thermal comfort:
	a) Thermal comfort: design
	b) Thermal comfort: verification

912

	c) Use of existing systems to provide thermal comfort	
	Ventilation	
	a) Natural ventilation	
	b) Artificial ventilation	
Credit9	Olfactory comfort	
Credit10	Acoustics Comfort	
Regional Priority		
Credit1	Regional Priority	
Innovation in Design		
Credit1	Innovation in applications	
Credit2	Innovation in material	
Credit3	Innovation in evaluation	
Health and Safety		
Credit1	Design for the disabled, the elderly and children	
Credit2	User safety and health quality performance	

CREATION OF HISTORICAL BUILDING GREEN BUILDING EVALUATION MODEL

There are some criteria and sub-criteria used in the evaluation of historical buildings by green building certification systems. The criteria that allow the grading of historical buildings within the scope of green building evaluation systems are guiding in determining the extent to which the building is green and sustainable.

According to the evaluation results of the surveys conducted within the scope of the AHP method applications, the categories and the importance degrees of the criteria are established. As stated in Table 3, the importance degrees of the evaluation categories belonging to the model were created in three different classes as the application area: 1st Group Historical Buildings, 2nd Group Historical Buildings and Reconstruction Historical Buildings. As applying the AHP method, the hierarchical structure established is shown in **Figure 1**.
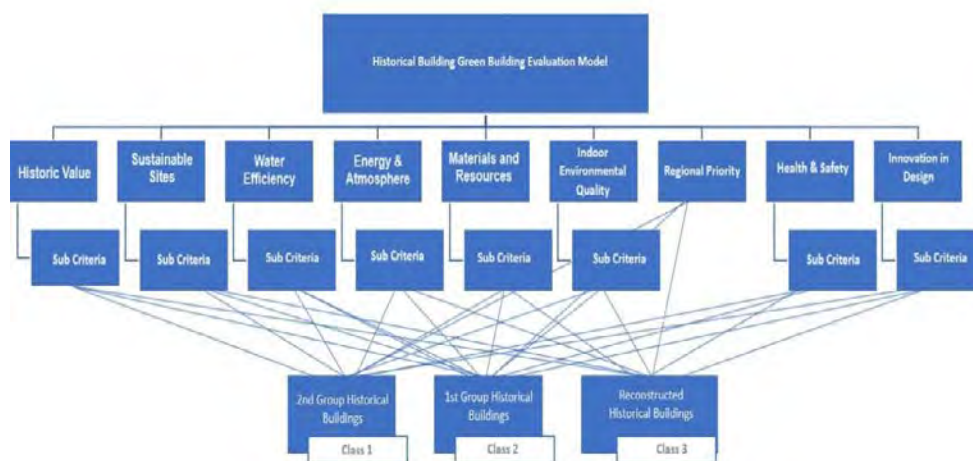
913

Figure 1. Historical Building Green Building Evaluation Model AHP Evaluation Hierarchy

As stated in Table 3, the importance degrees of the evaluation categories belonging to the model were created in three different classes as the application area: 1st Group Historical Buildings, 2nd Group Historical Buildings and Reconstruction Historical Buildings.

Table 3. The importance values of the Historical Building Green Building Evaluation Model categories determined by the AHP Method.

Evaluation Categories	1.Class	2.Class	3. Class	Sum.
Regional Priority (L: .045)	0,03	0,009	0,005	0,044
Energy and Atmosphere (L: .280)	0,069	0,099	0,11	0,278
Indoor Environmental Quality (L: .160)	0,046	0,067	0,05	0,163
Materials and Resources (L: .150)	0,078	0,042	0,028	0,148
Health and Safety (L: .031)	0,011	0,01	0,009	0,03
Water Management (L: .054)	0,016	0,013	0,023	0,052
Sustainable Site (L: .044)	0,017	0,012	0,017	0,046
Historic Value (L: .197)	0,121	0,05	0,024	0,195
Innovation in Design (L: .039)	0,015	0,012	0,012	0,039
Total	0,403	0,314	0,278	0,995

In the context of the evaluation categories of the building groups of "Historical Building Green Building Evaluation Model", the threshold point analysis graph is shown in Figure 2.

	1.Class	2.Class	3.Class
■ Regional Priority	0,03	0,009	0,005
■ Energgy and Atmosphere	0,069	0,099	0,11
■ Indoor Environmental Quality	0,046	0,067	0,05
■ Materials and Resources	0,078	0,042	0,028
■ Health and Security	0,011	0,01	0,009
■ Water Efficiency	0,016	0,013	0,023
■ Sustainable Sites	0,017	0,012	0,017
■ Historic Value	0,121	0,05	0,024
■ Inovation in Design	0,015	0,012	0,012
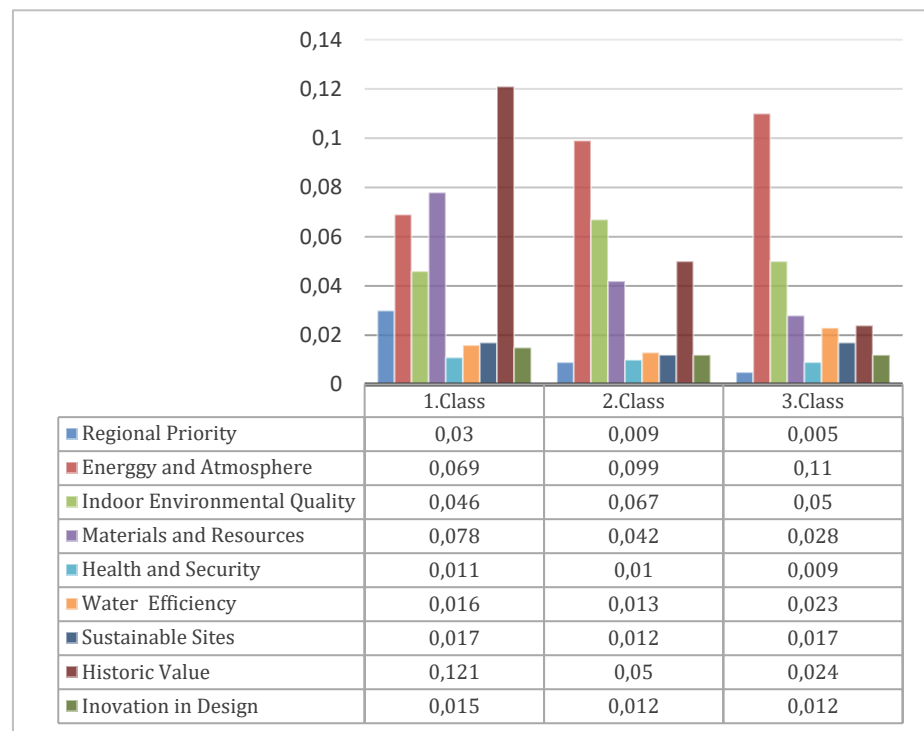
Figure 2. The threshold point analysis in the context of the evaluation categories of the building groups of "Historical Building Green Building Evaluation Model".

"The Regional Priority" category has no sub-criteria. The significance levels of this category obtained by AHP are shown in Table 3 and the threshold point analysis of the criteria is given in Figure 3. The importance degrees of the criteria that constitute the evaluation criteria within the scope of the categories, obtained by the AHP method, are

given in Table 4, Table 5, Table 6, Table 7, Table 8, Table 9, Table 10, Table 11, and Table 12.

Table 4. Importance levels of Regional Priority Criteria determined by the AHP Method

Regional Priority (L: .045)	1.Class	2. Class	3. Class
Regional Priority	0,03	0,009	0,005

Table 5. Importance levels of Historic Value Criteria determined by the AHP Method

Historic Value (L: .197)	1.Class	2. Class	3. Class
Scheduled maintenance plan (L: .126)	0,011	0,008	0,006
Project reversibility (L: .142)	0,018	0,007	0,003
Sustainable restoration site (L: .072)	0,006	0,004	0,003
Inquiring conservation application (L: .171)	0,022	0,007	0,004
Advanced analysis: energy audit	0,018	0,007	0,002
Specialist in restoration of architectural heritage and landscape (L: .099)	0,011	0,006	0,002
Advanced analysis: diagnostic tests on structures and structural monitoring (L: .252)	0,035	0,011	0,004

Table 6. Importance levels of Water Management Criteria determined by the AHP Method

Sustainable Site (L: .044)	1.Class	2.Class	3.Class
Site development: open spaces recovery (L: .055)	0,002	0,001	0
Heat island effect: non-roof and roof (L: .420)	0,002	0,004	0,013
Light pollution reduction (L: .120)	0,004	0,001	0
Construction activity pollution prevention (L: .063)	0,002	0,001	0
Site development: open spaces recovery (L: .130)	0,003	0,002	0,001
Alternative transportation (L: .056)	0,001	0,001	0,001
Stormwater design: quantity and quality control (L: .157)	0,003	0,002	0,002

Table 7. Importance levels of Water Management Criteria determined by the AHP Method

Water Management (L: .054)	1.Class	2.Class	3.Class
Water efficient landscaping (L: .316)	0,002	0,005	0,01
Water use reduction (L: .351)	0,002	0,004	0,012
Water metering (L: .072)	0,002	0,001	0
High efficiency appliances and process water systems 1 (L: .261)	0,01	0,003	0,001

Table 8. Importance levels of Energy and Atmosphere Criteria determined by the AHP Method

Energy and Atmosphere (L: .280)	1.Class	2.Class	3.Class
Optimize energy performance (L: .041)	0,004	0,004	0,004
Fundamental commissioning of building energy systems (L: .145)	0,028	0,009	0,003
Minimum energy performance (L: .058)	0,005	0,005	0,005
Use of automatic systems (L: .190)	0,015	0,034	0,004
Fundamental refrigerant management (L: .168)	0,005	0,015	0,027
Fundamental commissioning of building energy systems (L: .032)	0,001	0,002	0,006
Renewable energies (L: .366)	0,011	0,03	0,061

Table 9. Importance levels of Materials and Resources Criteria determined by the AHP Method

Materials and Resources (L: .150)	1.Class	2.Class	3.Class
Materials reuse (L: .285)	0,031	0,008	0,004
Storage and collection of recyclables (L: .089)	0,005	0,004	0,004
Materials reuse (L: .101)	0,005	0,005	0,004
Environmental impact optimization of the material used (L: .183)	0,01	0,01	0,007
Environmental impact optimization of the material used (L: .083)	0,004	0,005	0,004
Maintenance of load-bearing systems and non-structural elements (L: .110)	0,012	0,003	0,001
Use of Local Materials (L: .121)	0,01	0,006	0,002
Demolition and construction waste management (L: .028)	0,001	0,001	0,002

Table 10. Importance levels of Indoor Environmental Quality Criteria determined by the AHP Method

Indoor Environmental Quality (L: .160)	1.Class	2.Class	3.Class
Acoustic Comfort (L: .015)	0	0	0,002
Low-emitting materials (L: .207)	0,011	0,011	0,011
Minimum indoor air quality performance (IAQ) (L: .033)	0,002	0,002	0,002
Construction IAQ management plan (L: .034)	0,002	0,002	0,002
Indoor chemical and pollutant source control (L: .220)	0,012	0,012	0,012
Olfactory comfort (L: .047)	0,001	0,005	0,002
Outdoor air delivery monitoring (L: .036)	0,004	0,002	0
Air monitoring (L: .033)	0,002	0,002	0,002
Management and control of systems: Visual Comfort (L: .035)	0,002	0,002	0,002
Management and control of systems: Ventilation (L: .108)	0,002	0,011	0,004
Management and control of systems: Thermal Comfort (L: .145)	0,006	0,015	0,002
Environmental Tobacco Smoke (ETS) control (L: .088)	0,002	0,003	0,009

916

Table 11. Importance levels of Innovation in Design Criteria determined by the AHP Method

Innovation in Design	1.Class	2.Class	3.Class
Innovation in Assessment (L: .099)	0,002	0,001	0,001
Innovation in Material (L: .226)	0,003	0,003	0,003
Innovation in Applications (L: .675)	0,01	0,008	0,008

Table 12. Importance levels of Health and Safety Criteria determined by the AHP Method

Health and Safety (L: .031)	1.Class	2.Class	3.Class
Design for the disabled, the elderly and children (L: .776)	0,009	0,008	0,007
User safety and health quality performance (L: .224)	0,002	0,002	0,002

Historical Green Building Evaluation Model

As creating the model of "Historical Building Value Determination Method, the criteria were evaluated with the questionnaires carried out within the scope of the AHP method. For this evaluation, "Expert Choice 11" software was used.

The conversion of the obtained priority values to the scoring system consists of two stages. Firstly, the priority values of the categories of the Model are determined. Since the scoring system will be calculated of 100, the sum of the priority values of the relevant categories is equalized to 1, and then the resulting value is multiplied by 100. Thus, according to the 100-point of evaluation system score distributions were obtained and are indicated in Table 13.

Table 13. Evaluation Categories Score Distribution

Evaluation Categories	Score Distribution		
	1.Class	2. Class	3. Class
Regional Priority	7	3	2
Energy and Atmosphere	17	32	40
Indoor Environmental Quality	11	21	18
Materials and Resources	20	13	10
Health and Safety	3	3	3
Water Management	4	4	8
Sustainable Site	4	4	6
Historic Value	30	16	9
Innovation in Design	4	4	4
Total	100	100	100

In the Model, thereafter, creating the values of the categories according to the scoring system, the importance levels of the sub-criteria are determined by the AHP method. By making the sum of the importance levels equal to 1, the weight percentages of the criteria are determined Then, the point value of the relevant category is determined according to the weight percentages of the sub-criteria. With this method, the scoring system is established separately according to the three application areas. The score distributions of the criteria of the

primary categories are shown in Table 14, Table 15, Table 16, Table 17, Table 18, Table 19, Table 20, Table 21 and Table 22.

Table 14. Historic Value category criteria score distribution

Historic Value	1.Class	2.Class	3.Class
Advanced analysis: energy audit	4	2	1
a) I Level Analysis	Sub-criteria	Sub-criteria	Sub-criteria
b) Advanced analysis: thermography			
c) Advanced analysis: thermography and thermic conductance			
Advanced analysis: diagnostic tests on structures and structural monitoring	9	2	1
a) Diagnostic tests on structures	Sub-criteria	Sub-criteria	Sub-criteria
b) Diagnostic tests on structures and structural monitoring			
Project reversibility	4	2	1
Querying the Conversation application	5	2	2
a)Compliance with the intended use and settlement benefit Compliance with the intended use and settlement benefit	Sub-criteria	Sub-criteria	Sub-criteria
b) Structural similarity with the existing structure			
b) Structural similarity with the existing structure			
c) Diagnostic tests on materials and degradation			
Sustainable restoration site	2	1	1
Scheduled maintenance plan	3	3	1
Specialist in restoration of architectural heritage and landscape	3	2	1

Table 15. Sustainable Site category criteria score distribution

918

Sustainable Site	1.Class	2.Class	3.Class
Construction activity pollution prevention	1	1	0
Brownfield redevelopment	0	0	0
Alternative transportation	0	0	0
a) Alternative transportation: public transportation access	Sub-criteria	Sub-criteria	Sub-criteria
b) Alternative transportation: bicycle storage and changing rooms			
c) Alternative transportation: low-emitting and fuel-efficient vehicles			
d) Alternative transportation: parking capacity			
Site development: open spaces recovery	0	0	0
Stormwater design: quantity and quality control	1	1	1
Heat island effect: non-roof and roof	1	1	5
Light pollution reduction	1	1	0

Table 16. Water Management category criteria score distribution

Water Management	1.Class	2.Class	3.Class
Water use reduction	1	1	4
Water efficient landscaping	1	2	3
Water metering	1	0	0
High efficiency appliances and process water systems	1	1	1

Table 17. Energy and Atmosphere category criteria score distribution

Energy and Atmosphere	1.Class	2.Class	3.Class
Fundamental commissioning of building energy systems	7	3	1
Minimum energy performance	1	1	2
Fundamental refrigerant management	1	5	10
Optimize energy performance	1	1	1
a) Calculation of building energy performance	Sub-criteria	Sub-criteria	Sub-criteria
b) Energy simulation of building internal dynamics			
Renewable energies	3	10	22
Enhanced commissioning	0	1	2
Use of automatic systems	4	11	2

Table 18. Materials and Resources category criteria score distribution

Materials and Resources	1.Class	2.Class	3.Class
Storage and collection of recyclables	1	1	1
Demolition and construction waste management	0	0	1
Maintenance of load-bearing systems and non-structural elements	3	1	1
Building reuse:	8	2	1
a) To be used in its main function	Sub-criteria	Sub-criteria	Sub-criteria
b) The new function does not require structural changes			
c) The selection of the new function must be in accordance with the characteristics of the structure			
Materials reuse	1	2	1
Environmental impact optimization of the material used	3	3	3
Material extracted, processed and produced within a limited distance.	1	2	1
Use of Local Materials	3	2	1

Table 19. Indoor Environmental Quality category criteria score distribution

Indoor Environmental Quality	1.Class	2.Class	3.Class
Minimum indoor air quality performance (IAQ)	0	1	1
Environmental Tobacco Smoke (ETS) control	1	1	2
Air monitoring	1	1	3
Outdoor air delivery monitoring	1	1	0
Construction IAQ management plan	0	1	1
Low-emitting materials	3	3	4
a) Low-emitting materials: adhesives and sealants	Sub-criteria	Sub-criteria	Sub-criteria
b) Low-emitting materials: paints and coatings			
c) Low-emitting materials: flooring systems			
d) Low-emitting materials: composite wood and agrifiber products			

919

Indoor chemical and pollutant source control	3	4	4
Management and control of systems: Visual comfort	0	1	1
a) Lighting - Light Quality	Sub-criteria	Sub-criteria	Sub-criteria
b) Lighting System Control			
Management and control of systems: Thermal comfort	1	4	1
a) Thermal comfort: design	Sub-criteria	Sub-criteria	Sub-criteria
b) Thermal comfort: verification			
c) Use of existing systems to provide thermal comfort			
Management and control of systems: Ventilation	1	3	1
a) Natural ventilation	Sub-criteria	Sub-criteria	Sub-criteria
b) Artificial ventilation			
Olfactory comfort	1	1	1
Acoustics Comfort	0	0	1

Table 20. Regional Priority category criteria score distribution

Regional Priority	1.Class	2.Class	3.Class
Regional Priority	7	3	2

Table 21. Innovation in Design category criteria score distribution

Innovation in Design	1.Class	2.Class	3.Class
Innovation in applications	3	3	3
Innovation in material	1	1	1
Innovation in evaluation	1	0	0

Table 22. Health and Safety category criteria score distribution

Health and Safety	1.Class	2.Class	3.Class
Design for the disabled, the elderly and children	2	2	2
User safety and health quality performance	1	1	1

According to the Historical Building Green Building Evaluation Model, 40 points are the threshold points and a minimum of 40 points must be earned in order to have a certificate value. Certificate types and point distributions according to the evaluation system are shown in Table 23.

Table 23. Historical Building Green Building Assessment Model certificate types and scores

| Certificate	Score
One Star	40-49
Two Star	50-59
Three Star	60-79
Four Star	80 and above

920

CONCLUSION AND RECOMMENDATIONS

In this study, it is aimed to create a national evaluation system for Turkey that will evaluate and certify historical buildings according to green building criteria. In current green building evaluation systems, it is difficult to determine which aspect of the building's sustainability is more or less important. Most rating systems use experts to determine the importance of relevant criteria when evaluating buildings. In addition, in these evaluation systems, the same rating system is applied to all historical buildings, ignoring the type of intervention to be applied to historical buildings. However, as seen in the research results, the importance of the criteria varies according to conservation practices and registration types of historical buildings. Therefore, considering the historical buildings registration system and conservation practices in Turkey, the establishing of a different rating system to be prepared, is of critical importance to reduce errors in green building evaluations of historical buildings and to make the planning of conservation interventions more effective.

In this research, using the AHP method, the importance levels of the relevant criteria in terms of three different groups were determined and the scoring systems were created based on these differences. As seen in Table 24, it is seen that the "Energy and Atmosphere" category has the highest degree of importance in Class 3 (reconstruction) and Class 2 historical buildings, and the "Historical Value" category has the highest degree of importance in Class 1 historical buildings.

Table 24. Scoring distribution of evaluation classes
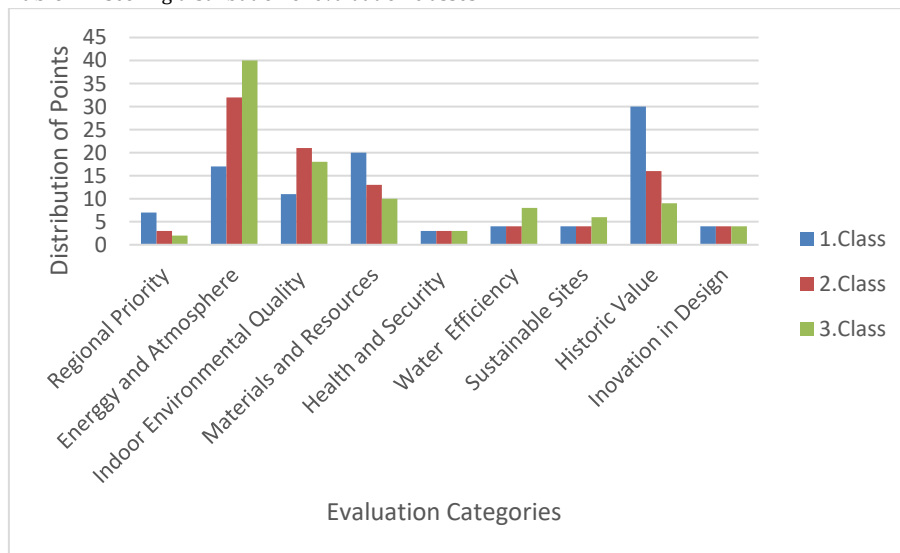
This study is important as it will help make green building evaluations of historical buildings easier. It is thought that green building rating of historical buildings can be done effectively using this methodology. In future studies, it would be beneficial to improve the evaluation systems by adding different criteria and also conducting a broader survey.

Historical building preservation itself is a green practice, but it must be supported by practices for conservation requirements. In Turkey, awareness of the use of environmentally friendly (green) practices in historical building conservation practices has not yet occurred and innovative steps need to be taken quickly in this field.

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Resume

Dr. Elif Gizem Yetkin, after successfully completing her undergraduate studies at the Architecture Department of Bahçeşehir University, she received her master's degree in Environmental Control and Construction Technologies Program at Istanbul Technical University. She worked in the design unit of Turkey's leading construction companies. She received her Ph.D. Selçuk University/Konya Technical University, in the field of Architecture. Her research

922

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923

Healing Applications in Hospital Interiors:

Ceramic Art

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Abstract

Healthcare facilities include complex partnerships that accommodate different types of users to meet the needs of the healthcare sector and require the collaboration of many disciplines to meet these needs. Hospitals, which contain the outputs of different fields of expertise from city scale to industrial product scale, are fed by the fields of engineering, architecture, and interior architecture in terms of space. Interior design, on the other hand, is divided into theoretical and practical specializations related to building types. The fact that health buildings have significant differences from other buildings due to their function and the obligations that would be met is of great importance in terms of the benefit to be provided to the public by the studies to be carried out in the field. Hospital buildings and spaces are constructed and designed according to the standards determined by the shade's laws, regulations, or guidelines where they are to be built. In this context, the study aims to provide a public contribution with art outputs that would positively affect the recovery of the user for the spaces that are generally open to the use of users in hospital interiors by researching the standards in the framework of international standards. However, since traditional and modern art contents have different spatial needs; ceramic art outputs, which are included in traditional art, focus on the specific evaluation of the research with its visual and tactile character. Using qualitative research methods; hospital construction guidelines and literature research were carried out by data collection and inductive methods. The research aims to make theoretical and practical contributions to the healing space with ceramic artworks/objects in the field of architecture and design.

925

INTRODUCTION

Healthcare buildings, one of the most important public building types, differ from other building types in terms of the number and quality of users. Hospitals, that serve patients and their relatives, are expected to have positive effects on healing in every sense. In other words, interior space is an important factor in the specified content. Hospital interior design and applications, which are a technical and physical necessity, have many limitations. The basis of architectural solutions is to prevent the risk of infection and disease for patients, relatives/companions, and medical staff. The issue of how to meet these criteria involves new answers every day. Because spatial changes related to health structures are changing and gaining new trends with the development of technology and medical practices. In this direction, with today's understanding of hospital interior design, new space needs arise that can meet the activities and actions that will positively affect the user socially and psychologically. Unlike in the past, in inpatient units where medical procedures are performed and where inpatients are hospitalized, improvement approaches are preferred in spatial parameters such as color, texture, landscape, natural lighting, and materials. In addition, the general spaces of the hospital are designed to support people's socialization, bring them together, and reinforce a sense of belonging (Ulrich & Gilpin, 1999), (Ulrich et al., 2008), (Nanda, Barbato Gaydos, & Nathorn, 2010).

The transformation of hospital interiors and the search for holistic well-being is an important break in the historical process. However, it is difficult to say that this break is surprising. Healthcare buildings evoke a sense of "fear of hospitals" in society, a place where people do not want to go. For many years, hospitals have been a place where people reluctantly and nervously go to receive treatment, and it is seen as a necessity to change the negative psychological effects of hospitals in every sense. In all relevant fields, contributions are being made both in theory and in practice to reduce or even eliminate the fear and anxiety of hospitals. At this point, the specialties of architecture, interior architecture, and design are utilized to increase the human-space relationship with applications that will support the healing effect of space. Art appears as an important tool for the mentioned branches. The use of artworks that are suitable for hospital interiors and that evoke positive feelings and emotions; can have healing effects for the audience (patients, patient relatives, staff, etc.).

For a designed object, item, or element, how it is shaped and its aesthetic values are as important as its products suitable for use and meeting the need. With the emergence of modern architecture, the three pillars of the idea of architecture; robustness, functionality, and aesthetics are among the requirements of this situation. On the other hand, the criteria including aesthetic needs in hospital interiors have a more flexible approach than the technical conditions to be met. They are

spatially restricted, mostly in line with the guidelines set by the administration of the country in which they are located, and there is a similar framework of limitations worldwide. In this context, there is no data on the qualities of artworks to be located in hospital interiors and how they can contribute to improvement.

In hospital interiors, art appears with two different approaches. The first is that it needs to be stored in areas that include therapy and activity, and the second is considered as a decorative element (FGI2, 2022) as well as having a distinctive function as a wayfinding and space identifier (FGI, 2022). In addition to these, the fact that art enables the creation of safer, more supportive, and functional environments in healthcare facilities provides an environment for discussion regarding the questioning of its quality rather than its stated characteristics. From architectural design to wall art, from access to natural lighting to the incorporation of nature through landscaping and healing gardens, art for hospital buildings has an impact on how the physical environment can reduce patient and caregiver stress, improve health outcomes, increase patient safety and overall quality of care, and reduce costs. The physical environment also plays an important role in improving staff health and safety, reducing errors, and increasing efficiency in care delivery and job satisfaction.

The process of creating art is generally associated with the therapeutic power of the creative process on human beings. Regardless of the artwork created by the experiences gained in this process, completed artworks in the environment also create good, positive feelings for people (Hill, 1948). While trying to provide patients with the most up-to-date scientific care, art also helps to remind medicine of its humanistic roots in healing. In addition to the contribution of the artwork to the individual, "art therapy" is also seen as a type of treatment that supports medical methods. Ceramics, on the other hand, differs from other art therapies as an important tool because it is created with manual techniques using natural materials. Ceramic making, which has a therapeutic character in itself, has a therapeutic character with the processes and experiences gained through the stages of idea work, conceptual process, shaping, firing, painting, glazing, etc. (Hamilton, Hinks, & Petticrew, 2003, p. 401).

It is seen that artworks/objects are frequently utilized in line with the concepts of space and healing and are among the current research topics. Within the framework of the specified subject (ceramic art and its healing effects), research has been encountered in the literature. However, the study has a different focus from the research in terms of focusing on the spatial healing aspect of the finished and assembled ceramic artwork/object in hospital interiors and discussing its parameters. Instead of focusing on the healing power of ceramic making within art therapy, the research focuses on the use of completed ceramic artworks in hospital interiors. In other words, ceramic art used as a therapy method is excluded from the subject of the study. The cross-section that provides the originality of the study is planned as the realization of the discussion of how to bring together the qualities that will motivate

927

positive emotions and provide hygiene-related obligations for the users who are in the position of the audience for the determined building type.

It is observed that qualitative/quantitative studies are accepted in art-related research conducted within health research (Patton, 2002). For this reason, the study is handled interdisciplinary with qualitative research methods. It evaluates the research on ceramic art and interior architecture disciplines in line with internationally accepted guidelines. The main objective at this point is to determine the criteria for artworks that can be used in hospital interiors by unconditionally accepting the internal process of art that is personal and connects with the artist. Unlike art galleries where artworks are commonly exhibited, health buildings, especially due to their function, do not have a retracted spatial setup where only the audience can understand the artwork in the most accurate and best way. For this reason, the knowledge of the interior space in which the artwork will exist and for what purpose is a very important parameter that must be met for the work to be exhibited. The two disciplines were analysed under separate headings and the discussion on how they can be evaluated together was evaluated together with the examples of the interiors of the completed health structures. Considering the resulting data, the criteria that can be concretely addressed by the ceramic artwork/object that takes place functionally and aesthetically in the hospital interior space are presented.

However, the data on the quality of artworks to be placed in hospital interiors describes a very wide area since it is obtained with inputs involving creativity. In hospital interiors, there are technical requirements that must be met according to the functional areas. In this sense, it is thought that internationally used guidelines will make important contributions to the study. There are building and space standards determined by local governments in many countries. The regulations and academic studies used have been researched in depth and it has been seen that the "Health Building Note General Design Guidance for Healthcare Buildings (HBN, NHS)" and "Guidelines for Design and Construction of Hospitals, Guidelines for Design and Construction of Residential Health, Care, and Support Facilities" design guidelines used in the UK and the USA have been evaluated as a resource by creating an infrastructure for the regulations and guidelines used in other countries. For this reason, the guidelines mentioned within the scope of the content of the study play an important role in determining the quality of ceramic artworks. The study aims to create an improvement-oriented discussion, especially in determining the quality and technical needs of ceramic artworks to be placed in hospital public spaces.

REQUIREMENTS FOR HOSPITAL INTERIORS

The most valid definition for the concept of health is the one used in the constitution of the World Health Organization (WHO) in 1946: "Health is not merely the absence of disease or infirmity, but a state of complete physical, mental, and social well-being." Although the concept and its content date back long before today, the WHO officially uses the same definition in 2022 (WHO, World Health Organization, 2022). As mentioned, the concept of health is considered as a whole. This approach has a perspective that is far from only physical well-being. The article "The dissemination of the benefits of medical, psychological and related knowledge to all people is essential for the attainment of full health." in the same definition concludes that all disciplines should be utilized for the public good.

In general, the technological aspect of healthcare services and architecture is influenced by three main factors. The first is linked to the need to ensure safety and security in a high epidemiological-risk environment. The second is related to the need to incorporate advanced technology required for medical equipment and building infrastructure. Finally, the third is related to the "Cartesian dualism" in medical sciences (the separation of the soul from the body). Fortunately, the healthcare architecture of the 21st century is in the process of dynamic transformations resulting from a change in the approach to patients. The holistic perspective is gradually influencing medical sciences and as a result, patient needs are discussed in three equally important parameters: biological, social, and psychological (Awtuch & Gębczyńska-Janowicz, 2017). In this respect, it can be said that both in the fields of architecture and interior design, importance is given to aesthetic-related details, and interest as a specialty has increased. It is also noticed that visual art has found a functional place in spatial arrangements and the possibilities of the exhibition have expanded. Therefore, for hospitals that serve the public with their complex and high capacity in health spaces; in addition to medical, and psychological treatments, there is a need for the knowledge and sharing of interior architects, architects, and designers with the healing applications of the space. In addition according to Horsburgh Jr. (1995); healthcare facilities are inextricably linked to the services they provide. Architectural design is crucial to the healing process since the quality of the space in these structures has an impact on the results of medical treatment. Many of the aesthetic features of space that make hospitals appealing are essential to effective design in all kinds of structures. In this sense, a well-designed hospital exhibits the talent and artistry of architects at work. This development of hospital design from its postwar emphasis on functional efficiency to a balance between function and aesthetics is represented by the appearance of these traits in modern facilities.

Understanding the spatial attributes that make up a successful hospital is important for healthcare providers for two reasons. Firstly,

928

healthcare providers should be aware of the impact of spatial considerations on recovery to better manage patient care. Secondly, informed healthcare providers are advocates for good design in the planning and construction of healthcare facilities (Horsburgh, 1995, p. 735). Because it is known that hospital structures where health services are provided create negative emotions, especially psychological, in users. In other words, the person who goes to the hospital for the treatment of his/her disease condition may experience stress before starting the treatment process, reinforced by his/her previous experiences user will spend in the hospital, will probably feel pain, and will have a difficult process.

The fear of hospitalization, which is socially engraved in individuals' minds, brings many psychological problems for the inpatient. In addition, the spatial change of the entire environment and the constant surroundings by professionals (healthcare personnel and staff on duty) cause the patient and patient relatives to be psychologically negatively affected and even damaged (Nash, Darby, & Nash, 2015). Furthermore, hospitalized patients are under both physical and psychological stress. Most experience some regression to earlier stages of psychological behavior. This has important implications for the interactions between the user and the hospital environment. People under illness stress are more susceptible to information overload, less able to process information provided by the environment, and more dependent on the help of others. (Shumaker & Reizenstein, 1982). Patients and their families often use the hospital for the first time or infrequently. However, to a lesser extent, friends and family of the patient also experience similar psychological, social, and physical difficulties as the patient. They can be easily frustrated by the failure to utilize spatial configurations that are familiar to them, that are not intimidating to users, and that can create a sense of belonging (Carpman & Grant, 1993).

The search for the effective interior design of hospitals, which ensures the safety of the user in every sense and above all aims to create a positive attitude toward patient welfare, leads to regular art exhibitions being brought/opened in medical facilities. Especially the spaces where medical examinations and treatments take place, where the technical requirements are drawn with very strict limits, are excluded from the subject at this point. The selection of artworks to be used in patient rooms and specific areas where medical practices are carried out requires the utmost care and attention. The use of artworks/objects in the interior design of areas with the lowest risk of infection in the hospital (general spaces such as waiting rooms, and communication rooms) is quite common (Awtuch & Gębczyńska-Janowicz, 2017).

In short, enabling the creation of healing spaces with a user-oriented design approach in healthcare buildings is becoming a necessity for today's design approach. With the fear of hospital, the difficulties experienced in the treatment process, and the changes experienced socially, which have been reinforced by our experiences, there is a need

929

to contribute to society from all disciplines with approaches that will contribute to the healing process. In particular, it is necessary to contribute to healing with the use of artworks and artistic practices that inspire creative ideas. In this context, the research content covering architecture, design, and art branches aims to contribute by discussing the requirements to be met for hospitals and the effect of art together.

THE CONCEPT OF HEALING

Architecture Hasol (2008) defines the concept of recovery as "rehabilitation". "Recovery" refers to a positive process in which a person feels completely well. In the process of recovery, in addition to medical practices; therapies, interaction with natural factors, positive changes in social relations, etc. are practices and methods that have therapeutic and beneficial effects. These positive effects are not a concept used only for the treatment processes of patients. On the contrary, the environment and atmosphere of each affect the mood and physical condition of its users. In the historical process, many healing practices and examples are encountered. However, the evaluation of the concept as a field of study takes its place among the current study topics with the concepts of "healing" and "therapeutic" in the international sense.

Research from various disciplines suggests that a range of environmental features can have powerful healing and therapeutic benefits for their users (Ulrich R., 1991),(Scher, 1996),(Murgia & San Martin, 2002). These features include natural light and artificial light, color, views, artwork, scent, modulation of space and form, arrangement of furniture, scale and proportion, sound, texture and materials, movement through space and time, and indoor and outdoor space (Mazuch & Stephen, 2005). In other words, a healthy environment that promotes healthy living can contribute to the healing process by creating a supportive physical and social environment. Such environments aim to promote a sense of well-being, reduce stress, and fatigue, and develop a sense of hope and a positive attitude in patients (Awtuch & Gębczyńska-Janowicz, 2017). In addition, the inclusion of artistic performances and activities in the healthcare experience and its implementation in medical settings is frequently found in the literature with positive outcomes. Art not only helps to create a safe and supportive environment, but also improves patients' physical health and well-being (Tse, Ng, Chung, & Wong, 2002), (Lankston, Cusack, Fremantle, & Isles, 2010).

As mentioned, there are numerous studies on the effects of artworks on viewers. According to a study, it has been observed that patients who have visual artwork in the patient room have less desire to use painkillers. The same study reveals that the healing process of patients who have artwork in the patient room is less compared to other patients (Farokhi, 2011). In short, having artworks in hospital interiors, and thus pursuing an aesthetic concern in the interior, has a healing character beyond its mission. Research conducted at Chelsea and Westminster

930

Hospitals shows that colors and patterns that will attract the attention of the child user create a focal point during the examination and treatment of children and facilitate the health personnel **(Figure 1)**.
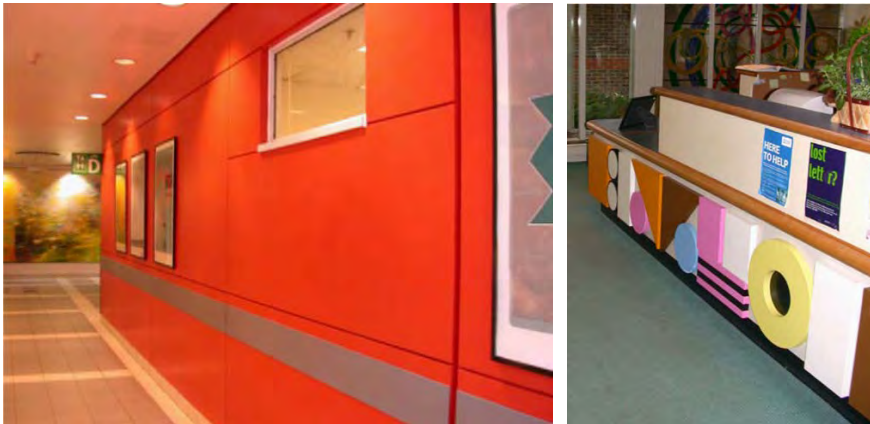
In 2017, London-based designer Adam Nathaniel Furman realized a ceramic application in the same hospital interior to utilize the healing power of art. The work is in the tiled entrance and reception area of the Chelsea and Westminster Hospital maternity center. The tiled walls are made of sturdy, durable porcelain that is easy to clean and hand-printed with chromatically deep and rich colors. The theme for the interior, which was designed as part of the project, was the emergence of colorful vegetation with the theme of birth and rebirth "associated with the joy of spring" through the project called Radiance **(Figure 2)**. The 2006 research, the current interior design, and the change in current practices and design approaches are easily recognizable.

It is known that the social structure can be carried into the hospital with visual arrangements and this situation positively affects the patient's motivation (Suter, 2007). In addition, for patients and healthcare professionals who are in the hospital environment for a long time, the selection of objects that are visual works of art (paintings, sculptures, ceramics, patterns, photographs, etc.) exhibited and/or to be exhibited in the hospital interior is extremely important (Eisen, 2006). The use of visual artworks that appeal to the tastes of the people in the hospital environment in hospital interior designs increases the sense of belonging, happiness, and peace in the user. For this reason, taking the

opinions of the users before any kind of architectural and decoration-based arrangement to be made in the hospital environment will contribute to making the realized arrangements a part of the healing and improvement process (Salderay, 2018).

RELATIONSHIP BETWEEN CERAMIC ART AND HOSPITAL INTERIOR SPACE

Today, the primary function of a work of art is accepted by society as a "decorative" element. However, apart from aesthetic and visual satisfaction, art also sometimes contributes to creating a functional, healing effect. Works of art have the power to connect with other people (personally and socially) by creatively expressing design ideas. The artist may create a work of art for the sole purpose of using its decorative function. Ultimately, art is the creative expression of an idea with the power to mobilize individuals' thoughts, feelings, beliefs, or ideas. This form of expression can come to life in various ways (Kılıç, 2022, p. 1). According to Akbudak and Akpınar (2021), art is the aesthetic products that people put forward with a certain creativity to the extent of their abilities, the experience they have gained throughout their lives, and the emotions they feel.

Hegel states that the general need for art is a rational need that pushes man to become conscious of the inner and outer worlds and that this situation pushes man to make an object from these two worlds in question, through which he will recognize himself anew (Hegel, 1982, pp. 75, 76). He explains that the creations of art are related to and like nature (Hegel, 1982, pp. 68, 69). The work of art presents itself as an external object with an unmediated determination, with a sensory individuality that gives it its color, form, and voice, or with a special intuition. The aesthetic gaze, aesthetic observation, and aesthetic perception do not think to go beyond this unmediated objectivity presented to it and do not try to grasp this objectivity as a universal concept, as science does. The behavior of art distinguishes itself from the practical behavior of desire because art wants its object - its object - to continue in complete freedom. Whereas desire is used by destroying its object for its use. On the contrary, aesthetic contemplation distinguishes itself from the theoretical contemplation of the scientific intellect, the contemplation of the mind, because art attaches itself to the individual existence of its object and does not seek to transform it into an Ideal or universal concept (Hegel, 1982, p. 79). In other words, in art, there is no chance of encountering one and only one reality that can only be perceived through the senses. Personalization and creating our own experiences or benefiting from our own experiences support the "intellectual" nourishment of the person and the building of a new world. The open-ended art/design object is a means of questioning, creating new ideas, getting out of the situation and mood one is in, and thus searching for answers. For this reason, artworks in the interior space, especially in

932

933

health structures, are of great importance. The inclusion of artworks/objects in the areas of use by both children and adults allows people to define themselves by discovering their potential and limits with works that include a sense of freedom, creativity, and rich stimuli. Under these conditions, it is not enough to include the elements of art in the interior space. It should not be forgotten that the quality of the work of art is also of great importance.

Hospitals, where people necessarily go for health-related problems, contain spaces with negative connotations in society. In this context, it is observed that there have been significant changes in hospital buildings in terms of design approach and artistic works to break this perception in recent years. Practices that will increase the sense of belonging and support the reduction of negative emotions, evoke nature, or bring nature itself inside are widely used.

There is considerable evidence that art depicting nature reduces stress levels and anxiety that affect the waiting experience. Studies have shown that creating an art-enriched environment in waiting areas increases the attractiveness of the physical environment, leading to a higher perception of quality of care by the patient. It also shows that the patient is less anxious and the communication with health personnel is more affirmative and positive (Pati & Nanda, 2011). In this sense, one of the completed examples is Maida Smile Clinic in England. It was awarded the British Private Dentistry Awards, IIDA Asia Pacific Interior Design Awards (Healthcare Category), Healthcare Category of Arch Daily's Building of the Year Award, and INSIDE Festival of Interiors Award, especially with the ceramic application in the waiting area. The interior design idea is based on the abstraction of ceramic dental implants, which are widely used in restorative dentistry. More than 500 handmade disk-shaped ceramic elements were used in the interior design **(Figure 3)**.

Figure 3. Maida Smiles Clinic waiting area, England. (https://maidasmiles.co.uk/about/, Access Date: 19.12.2022).

Color is one of the leading factors in the effect of the artwork on the person. However, on the situation, event, emotion or concept to be explained; form, texture, and applications that create a 3D effect are perceived as a whole by the audience. In other words, the viewer sees the work or works in front of them as a whole and mentally and spiritually evaluates the expression of the work, which is the focus of the creator. Since the mid-twentieth century, research has revealed that colors have profound effects on people's emotions, behaviors, and bodies (Clark,

1975). Although the color element is descriptive of the design work, it is part of a whole. It is one of the dominant features that support an atmosphere, the transmission of a concept, or the passage of emotion to the viewer. Ceramic art and products are like the real world and appear in three dimensions. In addition to height, width, and length, ceramic products have other features such as mass, depth, and texture. Along with the color used, the user qualitatively encounters many effects. The fact that figurative three-dimensional products can be created with the help of ceramic applications also helps the products to have a symbolic function (Sholt MA & Gavron MA, 2006). For this reason, the quality of ceramic artwork in the interior cannot be discussed as one-dimensional. In addition to its two- and three-dimensional effect, many qualities will affect the work such as brightness-darkness, color, choice of material, lighting in the interior, the area where it is located and its relationship, etc. While how these parameters will be related and how they will form a whole is a problem, the realization of design works by foreseeing the feeling that the combination of atmosphere and the experience of the work will create in the audience adds a new question to the problem that needs to be answered.

Initiatives that bring artworks/objects, installations, and events into medical spaces aim to increase the efficiency of medical services, transform the image of sterile hospital architecture, and define and expand high-quality public spaces (Awtuch & Gębczyńska-Janowicz, 2017). However, it is seen as a necessity to set standards for art, which can be considered an integral part of health. Art's use and positive effects on health services and spaces are theoretical and practical fields of study. Artistic works in the interior space can appear as a finishing element of the space or as an exhibited work. Completed in 2018, the Edinburgh Hospital, whose ceramic design and application were realized by Frances Priest, is an example in this sense in terms of displaying both a decorative and functional attitude. The design, which reinterprets the Victorian era in the interior and was completed by a team of 20 people, is used as a finishing element in the hospital corridor **(Figure 4)**. It is seen that the historical, traditional, and cultural identity of the geography of the hospital, which creates a defining identity by differentiating the corridor from other spaces, is aesthetically reflected as a design element. In addition to their functional and aesthetic roles, buildings also carry symbolic meanings by making visual references to cultural icons. Because patients and their families need to focus their energies on healing, architects design hospitals to provide an environment of safety, cleanliness, and physical comfort. In this way, patients; are encouraged not to worry about safety, health, or physical discomfort (Horsburgh, 1995, p. 738). Similarly, it is suggested that the works of art in the interior create familiarity with the culture of the place where the building is located.

Multiple additions to a facility often lead to access and orientation problems, and today's hospitals are known as labyrinths due to the

careless blending of new and old structures. As with the Edinburgh Hospital, with the need for increased capacity today, the interior should be supported with easy-to-read applications between the old building and the newly built or refurbished areas that feel complex to the user. Often the abundance of signage and brightly colored lines on the walls and floors of the hospital proves how difficult it is for patients to navigate and find their way around (Horsburgh, 1995, p.735). It is possible to alleviate these disadvantages with the functional use of artworks and transform them into an application that offers convenience for the user.

Figure 4. Edinburgh Hospital corridor, England. (https://www.designcurial.com/news/frances-priestceramic-art-engages-the-senses-at-new-hospital-7286440, Access Date: 20.12.2022).

In Mount Carmel East Hospital in Ohio, there is a corridor designed and realized by Natalie Blake Studios. The hospital interior has a ceramic wall panel consisting of 15 equal parts. The design, consisting of the abstraction of tree trunks, branches, and leaves, was assembled and exhibited on the wall **(Figure 5)**. Unlike Edinburgh Hospital, the ceramic work does not have a functional character. As mentioned before, the qualities sought and intended to be met in the interior space vary according to the space and the artist's approach.
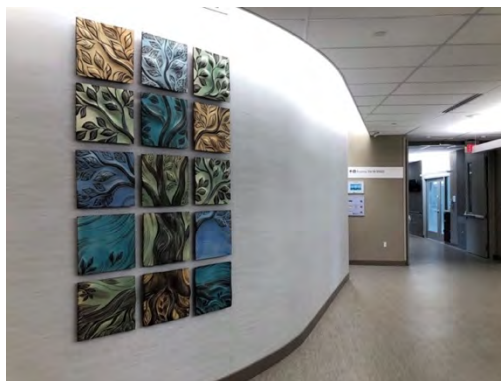
Figure 5. Mount Carmel East Hospital, Columbus, Ohio (https://www.natalieblakestudios.com/project-gallery, Access Date: 20.12.2022).

Hospital architecture and interiors are mostly determined by the institutional identity, which is determined before the construction phase. Plan, section, exterior views, and interior space; qualities such as circulation, hierarchy, and 3D effect are handled as a branch of the conceptual process / corporate identity that has already been created. By the way, the interior design is handled, information on how to analyze more detailed and small-scale details such as the quality of graphic elements (font size, color, typeface, etc.), the formal character of openings, and transitions are created. The preferences for the use of

artworks in the interior space are constructed similarly to these elements. At this point, it is necessary to determine the criteria for the ceramic artwork/object to be placed in hospital interiors. It is recommended to conduct interviews regarding the selection or ordering of the artwork by the interior design and the place where the ceramic artwork will be exhibited **(Table 1)**.

Table 1. Table on the content of ceramic artistic elements to be used in the hospital's general interior space (Çukur & Güller Delice, 2011)(Read, Sugawara, & Brandt, 1999)(Ulrich & Gilpin, 2003). (compiled by the author).

Content	Description
Material	It should not contain chemicals that may harm human health.
	Surface paint and glaze materials must not pose a health risk.
Color	Works should be selected or constructed by the hospital interior design approach. However, an institutional image should be avoided, on the contrary, a home feeling should be created.
	Colors should be chosen with functional, symbolic, emotional, and aesthetic purposes in mind.
	The application should be considered by evaluating the intensity (color saturation) of the colors to be used.
	The designated color should not only appear in contrast.
	Form, space, and light should form the components of architectural design.
	Dominant characters that create gender discrimination should be avoided.
	Due to the exciting effect of warm colors and the calming effect of cool colors, it is beneficial to use color/colors functionally.
	Color saturations that will not tire the eye should be preferred.
	Colors, tones, and brightness that will reinforce the feeling of home (ambient warmth) should be preferred.
Shape	Forms that will collect dust and pose a risk of infection should be avoided.
	Sharp and pointed corners should not be used where there is a risk of accidents.
Texture	Sharp and pointed tissues should be avoided.
	It is recommended to avoid very small and complex, multi-colored designs with patterns and textures.
Concept	It is suggested to have a landscape or feel.
	It should reflect relaxing, calm feelings, like water.
	Concepts that carry positive cultural traces and create a sense of familiarity can be utilized.
	The use of forms that reflect the feeling of plants and gardens is supported.
	It should focus on motivating design ideas.

936

	It is recommended to reflect open-ended and imaginative ideas.
	It should convey warmth and a sense of belonging.
Surface Finish	Instead of a porous and retentive topcoat material, a material with little or no pores should be preferred.
Location and assembly	There should be no risk of falling or breaking.
	The use of three-dimensional artifacts on the stand should be avoided in public places with heavy human traffic.
	The risk of accidents should be minimized by avoiding the use of sharp, hard-edged objects.
	The place and height of the installation should be determined in collaboration with the artist who created the work.

CONCLUSIONS

The subject and expertise of health structures and interior design are constantly renewed within the scope of developing technology and therefore changing needs. Spatial applications in hospitals, where health services are provided to all segments of society without interruption, need to be renewed for many reasons. Spatial applications are made for reasons such as wear and tear with continuous use, renovation of the existing area with the need to update (refresh) the space over time, construction of new areas, and increase of existing areas and their relationship with the general character. At this point, the study aims to discuss a specific area that includes hospital users; patients, patients' relatives, and working staff for an aesthetic need that is not considered a technical need. Because healthcare facilities should provide a therapeutic environment where the overall design of the building contributes to the healing process and reduces the risk of healthcare-associated infections, rather than being a place where only treatment is provided. In this context, HBN recommends the use of artwork, especially in patient rooms, for stimulation and distraction from the disease state (HBN, 2014).

To improve the psychological effect of the space on the users positively, the interdisciplinary literature was analyzed and the basis of the study was formed. In addition, the study focuses on the basic requirements that hospital interiors should meet and tries to offer a new perspective on art outputs, which are considered aesthetic requirements. In other words, the aesthetic values in hospital interiors are approached technically. In this context, a detailed examination of ceramic art, processes, and outputs, which are among the branches of art, has been carried out. Criteria have been established within the scope of content in terms of production, meaning, context, and manufacturing, especially for ceramic artifacts created or created for use in the common areas of the hospital.

937

As a result of the examinations and evaluations made; it is thought that ceramic works should add color to the hospital interiors and should not become the main purpose of being placed in the interior with wall panels or 3D applications by going beyond the standard plaster paint or plaster wallpaper applications. The suitability of each work of art for the hospital interiors where it is planned to take place should be discussed in advance. Similarly, ceramic artworks should be selected by considering how in what form, and with what kind of design they are related to within the required hospital interior. If the interior space is ready for use and it is planned to utilize art objects or applications within the existing space, the artist should be allowed to experience "that" space within the determined space atmosphere. Otherwise, while the interior design and atmosphere are in the design stage, the ceramic artist should simultaneously consider the design approach and the construction process as a whole.

The corporate identity created for hospital interiors should not be too cold and repulsive. The information regarding the selection or ordering of the artwork/object/object by the corporate identity mentioned earlier in the study is related to the suitability of the space to the design approach. On the other hand, the stated understanding of corporate identity meets the interior design that forms the design integrity rather than a professional and cold image. In other words, creating an institutional atmosphere should be avoided in the selection and use of artistic artworks/objects, but its compatibility with the design concept of the space should be discussed. Ceramic applications, which will reinforce the sense of belonging and support the feeling of home, are recommended to appeal to the user's senses in a similar way to other art applications and to establish a connection in a way that meets multiple senses to the maximum extent.

The design and selection of coatings and materials used in hospital interiors should be made taking into account the risk of infection. At this point, the ceramic artwork/object to be used in the space should be selected by the criteria determined. Art should be seen as an integral part of interior design.

As a result, in line with the criteria determined by the content of the study, it is recommended to use a long-lasting, easy-to-clean, hygienic, easily replaceable, accident and breakage-free, multi-part and hollow structure to reduce the risk of infection, compatible with the atmosphere of the space, motivating and healing ceramic artworks and objects.

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939

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Resume

Elif Özgen completed her undergraduate education at Hacettepe University GSF Department of Interior Architecture and Environmental Design in 2011, master's degree in 2014 and proficiency in art in 2022. Between 2010-2015, she worked as an interior architect in various companies in the private sector. She worked as a Research Assistant at Hacettepe University between 2015-2022 and at İnönü University between 2022-2023. As of 2023, she continues to work as an Assist. Prof. Dr. at Bolu Abant Izzet Baysal University Faculty of Architecture. Her research interests include healing spaces, art and healing, interior design of healthcare facilities etc.

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940

Evaluation on Spatial Quality in Retail Stores through Importance-Performance Analysis (IPA)

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Abstract

In today's world, where consumption is increasing rapidly, the designs of retail stores have gained importance with the increasing competition between institutions. One of the most predominant factors in the contact of the store with the customer is the spatial quality, which reveals the ability of the spatial features to meet user expectations. The study aims to determine the spatial quality indicators in retail stores and to expose the relationship between the importance and performance perception of these criteria among user groups. For this purpose, Importance-Performance Analysis (IPA), which has been a user-participated method and has powerful advantages in measuring service quality, was used in the study. In the first stage of the study, we determined the spatial quality indicators (functional, technical, and aesthetic) and sub-indicators by a literature review. The second stage is fieldwork performed in the determined study area, Koçtaş. At this stage, visual data of the study area was obtained, and 119 people (97 customers and 22 personnel) participated in the survey. In the third stage, IPA was used in analyzing the data. In the fourth stage, results were evaluated by supporting the visuals of the space. As a result of the study, the store was weak, especially in terms of aesthetic indicators, and significant differences were perceived by users between the importance and performance of spatial performance indicators. The study will lead up for research on examining the relationship between importance and performance in spaces with different functions by including the user in the process of determining and improving spatial quality.

942

INTRODUCTION

At present, when consumption is increasing rapidly with globalization, designs and business models of retail stores have become more of an issue. Due to the rising competitive environment, every enterprise has been in quest of new ways to attract the attention of their customer mass and provide them with a much better service. Since not finding sales sufficient, nowadays retail stores, whose basis is sales, aim to build long-term relationships with customers. Therefore, all kinds of communication between enterprises and customers have importance. The common goal of retail stores is customer satisfaction. Stores can be successful as long as they meet user satisfaction. Customer satisfaction includes all means of channels in which the trademark communicates with the customer during the purchase process. At this point, spatial features, one of the most influential factors in the communication between the store and the customer, become crucial. All qualities revealing the ability of spatial features to meet user expectations determine the quality of that space.

The concept of spatial quality is a part of physical conditions that directly affect the quality of life when this concept allows us to grade and compare everything as a criterion in all fields of life dealing with space-related issues (Kahraman, 2014: 80). The first space-based approach to the concept "quality" was discussed through "Utilitas, Firmitas, Venustas", defined as the conditions of a successful architecture by Vitruvius in "De Architectura". A functionally efficient, technically steady, and visually appealing building means qualified (Beardsley, 1998: 121). This approach is still valid today.

Spatial quality, regarded as satisfying the expectation of an individual within a relationship between humans and space, is about the quality of both private and public spaces (Kahraman, 2014: 80). Spatial quality refers to the sum of properties based on the ability of space to fulfill determined or potential needs (Juran, 1974). The quality of space can be evaluated through various components such as being unique, effective, and economical in terms of form, function, and technique, being appropriate for desirable activities, the atmosphere they create, cultural or symbolic value they have, and convenient price-performance ratio (Inceoglu, 2007). Altan (1993) draws attention to the space-user relationship by emphasizing the importance of arranging the space following habits, reactions, needs, and conformity of the user with their physical dimensions, together with the components such as material, form, texture, color, light, and shadow, in ensuring spatial quality.

Measurable physical dimensions of space users' feelings and thoughts about the physical properties of the space are directly associated with each other (Gulersoy et al., 2005: 25). That the concept of "spatial quality" related to personal feelings, experiences, and needs is relative, factors affecting the space quality can also be variable. Considering that the user is one of the most determining factors in evaluating the quality of space,

investigating users' expectations of and satisfaction with space by including the user in the process is one of the most significant necessities required to determine spatial quality. User satisfaction presents the performance of the space. Therefore, the study investigates spatial quality with the concept of "performance". In the most general expression, "performance" is a concept that reveals the results of a predetermined activity to reach a specified goal, numerically and in terms of quality (Akal, 1998). As part of fields related to architecture, "user satisfaction" or "usage behavior" is the other definition (Ozsoy et al., 1995).

To reveal the spatial quality in meeting marketing and sales targets of the stores requires investigating the communication between spatial factors and users' satisfaction. Importance-Performance Analysis (IPA), having remarkable advantages in measuring service quality, was used in this study. Even though IPA is a frequently used evaluation method in international literature, there is no study evaluating the spatial quality of retail stores yet (Lee & Heo, 2004; Shin, 2017; Erdoğan, 2020; Pekyaman and Baydemir, 2020; Addas et al., 2021). The study aims to explain how to use importance-performance analysis in measuring spatial quality in retail stores by making a sample application. For this purpose, spatial quality indicators of the store, Koçtaş, located in the city of Trabzon/Turkey, were specified according to their importance hierarchies and basic information was presented to re-evaluate the services provided by the store through an importance-performance matrix. Previous studies in the literature helped to determine the principal indicators affecting spatial quality within the study. As for Vitruvius (1808), the criteria determining the spatial quality of the built environment are strength, utility, and beauty. As for Preiser (1988), the quality parameters are the level of functionality and performance; health, safety, and security; and psychological comfort and satisfaction. Another Preiser et al. (1988) study defined the quality criteria as technical, functional, and behavioral. Technologic, aesthetic, and economic factors are the parameters that Voordt and Wegen (2005) suggested for spatial quality. Beardsley (1907) evaluates spatial quality indicators based on functional, structural, and visual features. Aydın and Uysal (2009) classified the components that affect space quality under three titles: technical, functional, and aesthetic. From this point of view, in this study, the quality indicators most commonly used to describe spatial quality are discussed under three headings: functional, technical, and aesthetic.

Functional quality, in the most general terms, is related to the convenience of the functions of the space in terms of use. Functional quality, which expresses the practical usability of the building, is about the extent to which it is suitable for the activities that should take place in the space (Can Karaoglu, 2009). Altınoluk (1998) underlines the interior dimensions of the building, the space organization, and the circulation between spaces in determining the functional quality. As for Zimring and Reizenstein (1980), we can obtain objective and subjective

outputs by comparing the performance measurements of the constructed building with the functional quality criteria determined by the goals and needs of the user. Functional quality, aiming for the spatial satisfaction of the user, is an indicator of the livability/usability capacity of the space (Yaldiz & Asatekin, 2016). Technical quality includes the physical properties of space regarding health and safety conditions. Features such as natural and artificial lighting, ventilation, heating, acoustics, structural integrity and durability, and the suitability of the techniques and materials used in the space reveal the technical quality (Yaldiz & Asatekin, 2016). Aesthetic quality is also related to the extent to which it is seen as a part of the culture, whether it is pleasant, warm, spacious, homey, or just commercial (Can Karaoglu, 2009). Measuring whether the space provides an aesthetic appearance suitable for user expectations reveals the aesthetic quality.

As part of the study, a survey form that consists of sub-criteria belonging to each of the indicators, i.e., functional, technical, and aesthetic, based on literature, was applied to two different user groups: customers and staff. In the light of the data obtained from the surveys, the titles "importance-performance analysis" and "perceived differences in spatial quality indicators from customers' and staff's aspect" in retail stores were determined and evaluated.

The study is significant in determining the spatial quality indicators in retail stores and revealing the relationship between the importance and performance perception of these criteria in different user groups. Thus, the study can help to understand the importance and performance of the spatial components of retail stores by permitting them to prioritize the determined areas, ensure spatial sustainability, and improve the design and organization of the factors affecting the space. Furthermore, the study suggests that retail stores should consider users' contributions in the design and planning phase. One of the most important benefits of the study is to open the way for other researches by raising the awareness of researchers and designers about examining the importance and performance relations in different functional spaces by involving the user in specifying and improving the spatial quality.

MATERIAL AND METHOD
Material

Surrounded by the coastal road, European Youth Olympic Memorial Park (EYOF), 100th Anniversary Park, and Karadeniz Technical University, the shopping mall of Forum is in the neighbourhood of Kalkınma, Trabzon. As it is near the airport and the coach station and located in the city center, the city-dwellers have intensely visited Forum Shopping Mall. Koçtaş store is on the basement floor of the three-story shopping mall. Near the store, with a 4,000-square meter area, are a chain store, other stores, and an entrance to the shopping mall parking garage (Figure 1).

944

Figure 1. Location and images of Forum Shopping Mall and Koçtaş Store, Trabzon

The primary reason why Koçtaş was designated as the study field is that it is intensively and continuously serving since it is one of the best-known stores of home development retailing, corporate, and located in the shopping mall having the best visitor circulation in Trabzon. The store has a wide range of products, including various product groups such as kitchen and bath utensils, decorative articles, indoor and outdoor furniture, home textile products, carpets, paint, curtains, etc. Another reason why Koçtaş was preferred is its complex structure containing various functions within itself.

Method

The present research is a mixed-method study that qualitative and quantitative methods are applied together. Document analysis, photography, and survey are the data collection tools. Within this scope, the study consists of four steps. Determining spatial quality indicators by reviewing the literature is the first step. The second step is to reach user groups by conducting a field survey, the third is to analyze acquired data, and the last is to evaluate findings. Figure 2 shows the representative graph demonstrating the study steps.
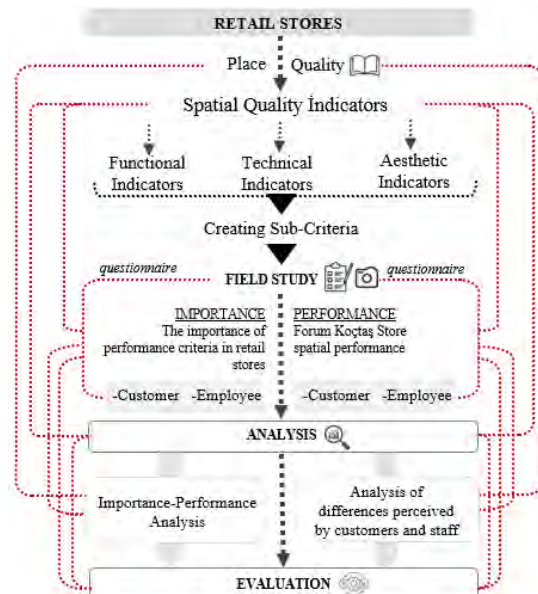
945

Figure 2. Representation demonstrating the study steps

As part of the first step, the indicators (functional, technical, and aesthetic) affecting spatial quality determined the sub-criteria by evaluating the literature sources. Within this scope, there are 46 sub-criteria in total: including 22 for functional indicators, 10 for technical indicators, and 14 for aesthetic indicators (Table 1).

**Table 1.** Spatial quality indicators and sub-criteria

Spatial Quality Indicators	Code	Sub-Criteria
Functional Indicators	F1	Transportation and parking facilities
	F2	Location of entrance-exit points
	F3	Comfort of entrance-exit points
	F4	Place of store sales points
	F5	Adequacy of store sales points
	F6	Ergonomics of store sales accessories
	F7	Space size
	F8	Space comfort
	F9	Suitability of space to the purpose
	F10	Suitability and flexibility of space to change of use
	F11	Space organization
	F12	Accessibility
	F13	Adequacy of storage area
	F14	Location of loading-unloading points
	F15	Adequacy of loading-unloading points
	F16	Ergonomics of circulation areas
	F17	Position and arrangement of product groups in the store
	F18	Adequacy of presentation accessories
	F19	Ergonomics of presentation accessories
	F20	Support of spatial orientation by accessories
	F21	Suitability of space to technology use
	F22	Signs and guidance signboards
Technical Indicators	T1	Natural lighting
	T2	Artificial lighting
	T3	Natural ventilation
	T4	Artificial ventilation
	T5	Acoustics
	T6	Sound insulation
	T7	Temperature
	T8	Moisture/humidity
	T9	Adequacy of technological infrastructure
	T10	Security and health
Aesthetic Indicators	A1	Visual quality
	A2	Visual effects of entrance-exit points
	A3	Space configuration
	A4	Fullness and emptiness of space
	A5	Appearance of accessories
	A6	Layout
	A7	Holistic perceptibility of space
	A8	Presentation quality and exhibition style of products
	A9	Hygiene
	A10	Color usage and harmony
	A11	Texture usage and harmony
	A12	Smell of space
	A13	Representation of corporate indicators/brand image
	A14	Store-window arrangement

The second step is the field study, and at this step, researchers took photographs of the study area and applied the questionnaire form to the

users. Cite photos helped promote and evaluate the study area. While preparing the questionnaire form, we used the criteria presented in Table 1. 10 people attended the pilot application of the survey. After correcting the incomprehensible expressions and eliminating the deficiencies, the questionnaire took its final shape. The questionnaire form consists of two sections. Demographic information about the user and their frequency of visiting Koçtaş store are the questions of the first section. The second section, which consists of 46 statements about spatial quality, includes a scale on which the participants evaluate the importance and performance levels of the space. Response categories of the scale items are on a 5-point Likert-type ordinal scale. We applied the survey form to two different user groups: customers and staff. In this context, 119 participants, consisting of 97 customers and 22 staff, filled out questionnaires.

The third step is an analysis stage composed of two sections. As part of the first section, we performed IPA in light of the data acquired from the surveys. IPA, a job search technique developed by Martilla and James (1977), interprets the relationship between the importance that users place on specified criteria and their performance. According to the IPA, quality means the importance of a product or service from the users' perspective and a function of performance perceived by users (Martilla & James, 1977). As is also clear from this definition, spatial quality is measured by the user's evaluation of the importance of the previously determined quality indicators and the satisfaction of the place in terms of these indicators. An importance-performance matrix helped in the analysis of the data. The matrix consists of a vertical axis representing "importance" and a horizontal axis representing "performance". After users declare their scores of importance and performance, the coordinates of each criterion are detected, and then they are distributed to four cells of the matrix. Averages of the axis obtained from acquired data determine the points of importance-performance axis (Martilla & James, 1977; Guadagnolo, 1985). Figure 3 shows the grid belonging to an importance-performance matrix.

947

Figure 3. Importance-Performance grid
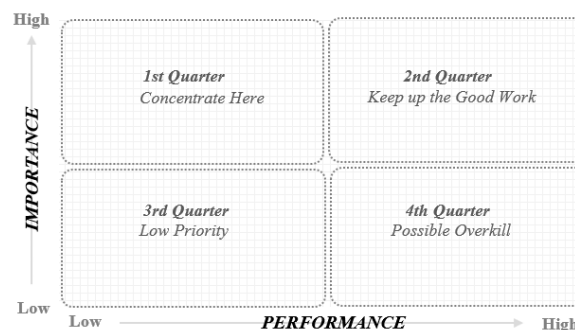
Cells displayed in the matrix are named as follows: "concentrate here", "keep up the good work", "low priority", and "possible overkill" (Martilla and James, 1977). The criteria in the first quadrant, "concentrate here", were considered essential by the users, but perceived the performance as

low, and it is thought that these criteria should be emphasized. The second quadrant, "keep up the good work", refers to high importance and high performance, and expresses the parameter that should protect the current situation. The third quadrant, "low priority", contains criteria considered low importance and low performance by users. In the second (high-high) and third (low-low) criteria, the performance is compatible with the importance given to the relevant statements by the participants. The parameter in the fourth quadrant, "possible overkill", is considered low importance but a high performance by the users (Martilla & James, 1977).

In the second section of the third step of the study, "differences perceived by the groups of customers and staff" are given in light of the data acquired from the surveys. A model of grids having information on staff and customer overlap assisted in presenting the data.

The fourth step of the study involves the evaluation of findings obtained from IPA and analyses related to differences in spatial quality perceived by groups of customers and staff. The images of space supported the review carried out in that phase.

FINDINGS

Findings on Demographic Data

The survey involved 119 participants, including 22 staff and 97 customers. Of the participants, 54.6% are female and 45.4% male; 40.3% range from 15 to 25 years old; 37% are between 26 and 45 years old; and 22.7% are over 45 years old. Of the participants, 18.5% have an educational background in high school, 66.4% have bachelor's degrees, and 15.1% are postgraduates. 38.7% are married, while 61.3% are single. 37% work in the private sector, 20.2% in the public sector, 10.1% are retired, and 32.7% are students. 20.2% of the participants have a monthly income of 0 to 2000 TL, 13.4% of 2001 to 5000 TL, 30.3% of 5001 to 10000 TL, 26% of 10001 to 16000 TL, and 10.1% of over 16000 TL (Table 2).

Table 2. Information on participants demographic data

Participant Profile		N	%	Participant Profile		N	%
Gender	Woman	65	54.6		Private sector	44	37
	Male	54	45.4		Public sector	24	20.2
Age	15-25	48	40.3	Profession	Retired	12	10.1
	26-45	44	37		Student	39	32.7
	45+	27	22.7		Not working	-	-
Education status	Primary school	-	-	Monthly income	0-2000 TL	24	20.2
	Middle school	-	-		2001-5000 TL	16	13.4
	High school	22	18.5		5001-10000 TL	36	30.3
	Bachelor's degree	79	66.4		10001-16000 TL	31	26
	Postgraduate	18	15.1		16000+ TL	12	10.1
Marital status	Married	46	38.7				
	Single	73	61.3				

Findings on IPA

In the IPA process, the mean of the scores given for each spatial quality indicator by the participants was first computed (Table 3). Concerning the acquired data, the gap between importance and performance was the highest for aesthetic indicators and the lowest for functional indicators.

Table 3. Importance and performance averages of spatial quality indicators

Spatial Quality Indicators	Importance	Performance	Gap (I-P)
Functional Indicators	4.27	3.63	-0.63
Technical Indicators	4.26	3.52	-0.74
Aesthetic Indicators	4.34	3.52	-0.82

We created an importance-performance matrix to provide the functional, technical, and aesthetic spatial quality levels of the Forum Koçtaş store. According to the IPA matrix, the aesthetic indicators were in the quadrant of "concentrate here", the technical indicators were in the quadrant of "low priority", and the functional ones were in the quadrant of "possible overkill" (Figure 4). When considering functional, technical, and aesthetic indicators, it is clear that the aesthetic ones primarily need to be concentrated on for enhancements or regulations.
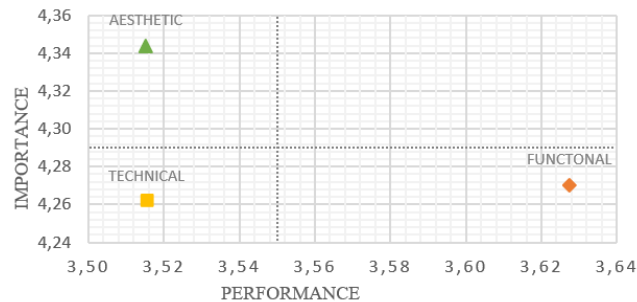

Figure 4. IPA Matrix for spatial quality indicators of the Forum Koçtaş Store

The averages of the importance and performance points given for each of the sub-criteria by the participants were separately computed (Table 4). We marked the criteria with the highest and lowest gap among the sub-criteria of each spatial quality indicator. For the functional indicators, the gap between importance and performance was the highest for the criterion "adequacy of store sales points" (-0.92) and "ergonomics of circulation areas" (-0.92) and the lowest for "space size" (-0.41). For the technical indicators, the gap between importance and performance was the highest for the criterion "natural ventilation" (-1.37) and the lowest for "sound insulation" (-0.40). Besides this, the "natural ventilation" criterion had the highest gap among the criteria, while "sound insulation" had the lowest. The gap between importance and performance concerning the aesthetic indicators was the highest for "the visual effect of entrance-exit points" (-1.35) and the lowest for "space configuration" (-0.56). When we examined the criteria in general, the criteria with the highest gap considered in the aesthetic quadrant.

Researchers created an importance-performance matrix to present "spatial quality levels of the Forum Koçtaş store". According to the IPA matrix, the second quadrant with both the highest importance level and

the highest performance level included 19 criteria (keep up the good work), the first quadrant with high importance and low performance consisted of 8 (concentrate here), the third quadrant with both low importance and low performance included 14, the fourth quadrant with low importance and high performance consisted of 5 criteria (Figure 5).

Table 4. Importance and performance averages for sub-criteria of spatial quality indicators

|	Code	Spatial Quality Indicators	Imp.	Perf.	Gap (I-P)
FUNCTIONAL INDICATORS	F1	Transportation and parking facilities	4.34	3.88	-0.46
	F2	Location of entrance-exit points	4.36	3.59	-0.77
	F3	Comfort of entrance-exit points	4.20	3.40	-0.80
	F4	Place of store sales points	4.23	3.74	-0.49
	F5	Adequacy of store sales points	4.37	3.45	**-0.92**
	F6	Ergonomics of store sales accessories	4.11	3.56	-0.55
	F7	Space size	4.25	3.84	**-0.41**
	F8	Space comfort	4.37	3.70	-0.68
	F9	Suitability of space to the purpose	4.58	4.12	-0.46
	F10	Suitability and flexibility of space to change of use	4.12	3.59	-0.53
	F11	Space organization	4.44	3.67	-0.77
	F12	Accessibility	4.50	3.72	-0.78
	F13	Adequacy of storage area	3.94	3.45	-0.49
	F14	Location of loading-unloading points	3.92	3.39	-0.54
	F15	Adequacy of loading-unloading points	3.86	3.38	-0.49
	F16	Ergonomics of circulation areas	4.47	3.55	**-0.92**
	F17	Position and arrangement of product groups in store	4.42	3.69	-0.73
	F18	Adequacy of presentation accessories	4.34	3.84	-0.50
	F19	Ergonomics of presentation accessories	4.33	3.65	-0.68
	F20	Support of spatial orientation by accessories	4.33	3.50	-0.82
	F21	Suitability of space to technology use	4.04	3.45	-0.59
	F22	Signs and guidance signboards	4.42	3.64	-0.78
TECHNICAL INDICATORS	T1	Natural lighting	3.94	3.08	-0.86
	T2	Artificial lighting	4.40	3.87	-0.52
	T3	Natural ventilation	4.28	2.91	**-1.37**
	T4	Artificial ventilation	4.39	3.56	-0.83
	T5	Acoustics	3.97	3.50	-0.48
	T6	Sound insulation	3.92	3.52	**-0.40**
	T7	Temperature	4.45	3.66	-0.79
	T8	Moisture/humidity	4.44	3.70	-0.74
	T9	Adequacy of technological infrastructure	4.18	3.57	-0.61
	T10	Security and health	4.65	3.80	-0.86
AESTHETIC INDICATORS	A1	Visual quality	4.53	3.49	-1.04
	A2	Visual effects of entrance-exit points	4.42	3.07	**-1.35**
	A3	Space configuration	4.17	3.61	**-0.56**
	A4	Fullness and emptiness of space	4.17	3.52	-0.65
	A5	Appearance of accessories	4.31	3.57	-0.73
	A6	Layout	4.40	3.52	-0.88
	A7	Holistic perceptibility of space	4.26	3.28	-0.98
	A8	Presentation quality and exhibition style of products	4.45	3.62	-0.83
	A9	Hygiene	4.66	3.85	-0.80
	A10	Color usage and harmony	4.32	3.62	-0.71
	A11	Texture usage and harmony	4.09	3.52	-0.57
	A12	Smell of space	4.38	3.58	-0.80
	A13	Representation of corporate indicators/brand image	4.27	3.65	-0.62
	A14	Store-window arrangement	4.39	3.31	-1.08

☐: lowest gap ☐:highest gap
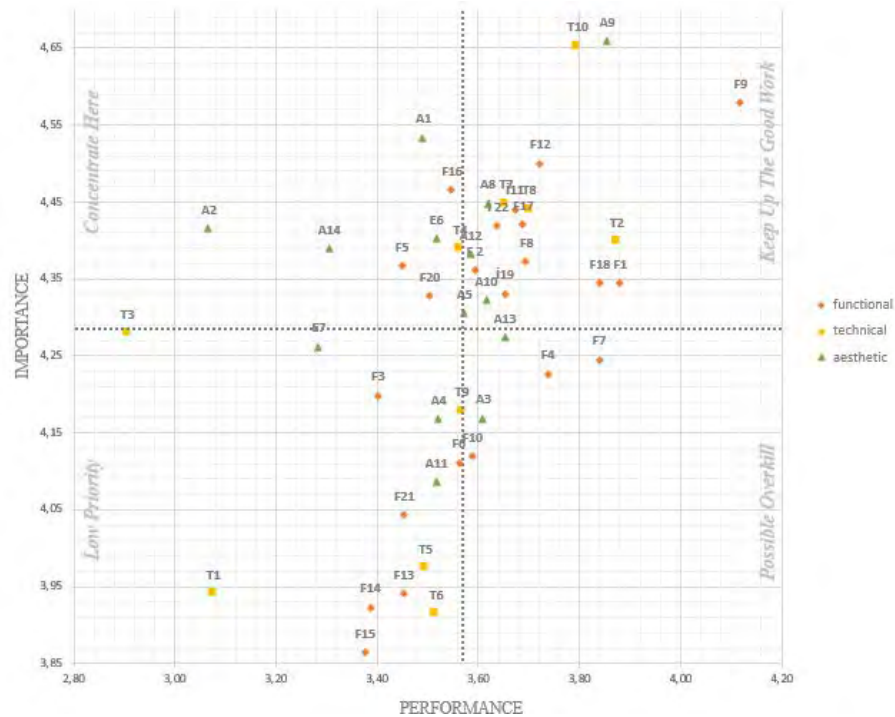
Figure 5. IPA on the spatial quality of the Forum Koçtaş store (Sub-Criteria)

Concerning the data acquired from the IPA, among the functional indicators in the first quadrant (concentrate here) were adequacy of store sales points (i5), ergonomics of circulation areas (i16), accessory support for spatial guidance (i20); among the technical indicators was artificial ventilation (T4); among the aesthetic indicators were visual quality (E1), the visual effect of entrance-exit points (E2), layout (E6), and store-window arrangement (E14) (Figure 5). The store managerial staff must make an effort to increase the performance of properties of the criteria found in the quadrant "concentrate here".

Regarding the data acquired from the IPA, among the functional indicators in the second quadrant "keep up the good work" were transportation and parking facilities (i1), location of entrance-exit points (i2), space comfort (i8), the suitability of space to the purpose (i9), space organization (i11), accessibility (i12), position and arrangement of product groups in store (i17), adequacy of presentation accessories (i18), ergonomics of presentation accessories (i19), signs and guidance signboards (i22); among the technical indicators were natural lighting (T2), temperature (T7), humidity/moisture condition (T8), security and health (T10); among the aesthetic indicators were the appearance of accessories (E5), presentation quality and exhibition style of products (E8), hygiene (E9), usage, and harmony of colors (E10), and the smell of space (E12) (Figure 5). Since the store meets the expectations in terms of the criteria mentioned above, no action is required.

About the data acquired from the importance-performance matrix, among the functional indicators in the third quadrant of "low priority" were the comfort of entrance-exit points (i3), ergonomics of store sales accessories (i6), adequacy of storage area (i13), the position of loading-

951

unloading points (i14), adequacy of loading-unloading points (i15), the suitability of space to technology use (i21); among the technical indicators were natural lighting (T1), natural ventilation (T3), acoustics (T5), sound insulation (T6), adequacy of technological infrastructure (T9); among the aesthetic indicators were duty the cycle of the store (E4), the holistic perceptibility of space (E7), texture usage and harmony (E11) (Figure 5). For the criteria found in the quadrant "low priority", the store managerial staff should upgrade the quality of the indicators to improve user satisfaction. However, those are not the criteria that need to be primarily enhanced because they were considered less important by the users. A precise cost-benefit analysis is required if any indicator or service in this quadrant is to be invested.

Concerning the data acquired from the importance-performance matrix, among the functional indicators in the fourth quadrant "possible overkill" were the location of the store sales points (i4), store size (i7), suitability and flexibility of space to change of use (i10); among the aesthetic indicators were store configuration (E3), and representation of corporate indicator/brand image (E13) (Figure 5). Since the criteria found in the quadrant "possible overkill" displayed performance higher than expected, the store managerial staff does not need to take any actions concerning these criteria.

Findings on Differences Related to Spatial Quality Perceived by User Groups

Functional, technical, and aesthetic components were examined for the differences in spatial quality indicators reported by user groups, and then pertinent data tables, or matrices, were created. There are two sections in each of the tables. We determined the average scores given to the spatial quality indicators in the first section and described their overall significance and performance levels with respect to customers and staff. Staff and customer scores for each sub-criteria were compared in the second section.

In evaluating the spatial quality concerning the difference between the importance and performance of the overall functional indicators, the customers (-0.76) were less satisfied with the space than the staff (-0.27). When comparing the sub-criteria in terms of importance, "fitness of space to purpose" i9 and "ergonomics of presentation accessories" i19 were considered more important by the customer group. The other criteria were all found more significant by the staff. When judging the sub-criteria in terms of performance, the staff's satisfaction level concerning Koçtaş store was higher than the customer group for each sub-criteria (Table 5).

Table 5. Functional quality of the store from customers' and staff's aspect

1. Functional Indicators (General)			2. Sub-Criteria	
	Staff	Customer	Importance	Performance
Importance	4.54	4.23		
Performance	4.27	3.47		
Gap (I-P)	-0.27	-0.76		

In evaluating the spatial quality concerning the difference between the importance and performance of the overall technical indicators, the customers (-0.79) were less satisfied with the space than the staff (-0.52). When comparing the sub-criteria in terms of importance, "artificial lighting" T2 and "artificial ventilation" T4 were remarkably considered more important by the customer group. The other criteria were all found more significant by the staff. When evaluating the sub-criteria in terms of performance, the staff group was more satisfied than the customer group for all of the criteria except for "temperature" T7 (Table 6).

Table 6. Technical quality of the store from customers' and staff's aspect

1. Technical Indicators (General)			2. Sub-Criteria	
	Staff	Customer	Importance	Performance
Importance	4.45	4.22		
Performance	3.93	3.43		
Gap (I-P)	-0.52	-0.79		

When considering the gap between the importance and performance of the overall aesthetic indicators concerning the space, the customer group (-0.97) was considerably less satisfied than the staff (-0.24). When comparing the sub-criteria according to importance, "visual quality" E1 and "visual effect of entrance-exit points" E2 were remarkably considered more important by the customer group. The other criteria were all found more important by the staff. When evaluating the sub-criteria in terms of performance, the staff group was much more satisfied than the customer group for all of the criteria in the Koçtaş store (Table 7).

953

Table 7. Aesthetic quality of the store from customers' and staff's aspect

1. Aesthetic Indicators (General)			2. Sub-Criteria	
	Staff	Customer	Importance	Performance
Importance	4.47	4.32		
Performance	4.23	3.35		
Gap (I-P)	-0.24	-0.97		

EVALUATION

Evaluations related to IPA and differences perceived by user groups are separately handled below. The evaluation concerning IPA is as follows:

The criteria in the quadrant "concentrate here" (high importance-low performance) affect and trigger each other. In this sense, the criteria "layout" and "support of accessories on spatial orientation" found in the quadrant "concentrate here" seems to be supportive. That "the sales points at entrance-exit points of the store" were considered as inadequate and thus being arranged in a dense formation caused "the visual effect of entrance-exit points" to take place in the quadrant "concentrate here". Likewise, the aisleways directly face the entrance, the absence of a store-window order, and the cramped and complex entrance area were found negative by the users. This situation caused the relevant criterion to place in the quadrant "concentrate here". All the criteria found in the quadrant "concentrate here" are the ones that can be improved under the store's managerial staff's control **(Figure 6)**.

Figure 6. Interior and exterior appearance of entrance-exit points of the store and sales points at entrance-exit points

The criteria taking place in the quadrant "possible overkill" (low importance-high performance) also affect and trigger each other, which is so considerable that the criteria concerning "suitability and flexibility of space to change of use" can be explained through "space configuration" and "space size". Another criterion emerging in this quadrant was the "representation of corporate indicators/brand image". The most explicit reason for this situation is associated with Koçtaş's corporate color, orange. Because all of the components of sign, guidance, and information were designed in orange color, and users can perceive the color from all over the store (Figure 7).
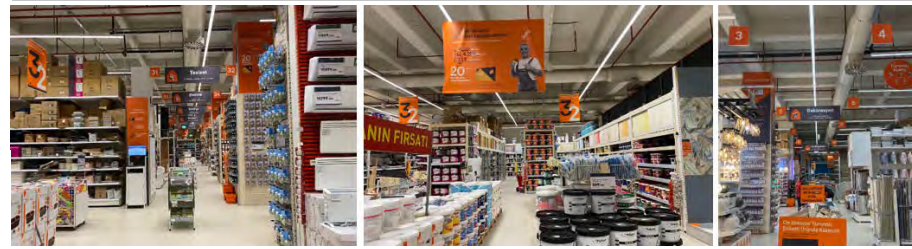
Figure 7. Orange color used for all components of sign, guidance and information

The criteria "natural ventilation" T3 and "holistic perceptibility of space" E7 in the quadrant "low priority" (low importance-low performance) verge on the quadrant "concentrate here" and these criteria need to be improved with higher priority than others. However, the "natural lighting" criterion is not directly under the control of the store management. The "holistic perceptibility of space" criterion is associated with the height of exhibition and presentation accessories. In other words, high accessories visually divide and make it difficult to perceive the space as a whole (Figure 8).

Figure 8. High exhibition accessories preventing the space from being perceived as a whole

The criteria in the quadrant "keep up the good work" (high importance-high performance) was services that the users found high importance and high performance. As a result of analyzing the data, 19 (41.3%) out of 46 criteria evaluated took place in the quadrant "keep up the good work". So we can say that the criteria in this quadrant affect and trigger each other. At this point, the "fitness of space to purpose" i9, "space organization" i11, "accessibility" i12, and "position and arrangement of products in store" i17 consolidate each other. Likewise, the criteria "appearance of accessories" E5 and "presentation quality and exhibition style of products" E8 among the aesthetic indicators are also related to each other (Figure 9).

Figure 9. Images concerning exhibition accessories and exhibition style of products

Evaluation of differences perceived by user groups:
• In general, compared to the customer group, the staff group is more satisfied with the space from functional, technical, and aesthetic aspects.

However, this high level of satisfaction could also be affected by the relationship between staff and the corporation for which they work.

• To ignore a problem faced every day could result in not taking it as an issue and conceding to it in time, which explains another reason why the staff seems to be clearly more satisfied according to all the indicators compared to the customer group.

• Among the spatial quality indicators, there seems to be a significant gap between the customers and the staff, particularly in terms of the aesthetic indicators, which can be explained by the fact that the staff utilize the space rather for work and service and therefore do not have extremely high expectations concerning its aesthetic and visual properties. On the other hand, customers have high-level expectations in terms of both technical, functional, and aesthetic indicators.

• Because the staff uses store areas frequently, the criteria for spaces like storage points, loading, and unloading points are particularly important to them. At this point, we can conclude that the customers responded in line with their personal knowledge and experience, even as the staff evaluated their needs and satisfaction during occupancy in determining performance.

CONCLUSION

Modernization, one of the most significant effects of globalization, has changed forms of production and consumption and has influenced many areas such as planning, architecture, and interior architecture. In today's rapidly increasing consumption, the spatial quality concept, which focuses on customer satisfaction in retail stores, has also gained importance. This study has tried to explain how a space, defined as high quality, can increase the satisfaction of its users and the performance of the place positively, specific to retail stores. The criteria for determining the spatial quality are divided into title and sub-criteria to present an easy and more understandable program holistically. Technical, functional, and aesthetic categories are the groups of indicators considered in the design and evaluation process. Thus, the researchers have envisaged a more systematic approach to revealing and reading the space quality.

Researchers determined the deficiencies of the store in line with participants' evaluations, in the scope of the study. The spatial quality of the store will also increase by eliminating these deficiencies. In the examined space, those functional and aesthetic indicators are at the forefront for the customer group. The staff group emphasized the technical ones rather than functional and aesthetic indicators. When evaluated in terms of all user groups, the deficiencies in issues such as the adequacy of the store sales points, the ergonomics of circulation areas, ventilation, visual quality, the visual effect of the entrance-exit parts, and the layout of the store draw attention. For this reason, priority should be determined by considering the magnitude of the value between importance and performance. Then, designers and store managers must

956

develop an intervention strategy by prioritizing the indicators with the highest performance difference.

Based on the data obtained from the study, the changes in the spatial consumption habits of the users are remarkable. Also, the aesthetic expectations of the users in retail sales spaces are high, apart from the shopping need, which is the first purpose of the store. In this case, a holistic approach considering not only functional and technical indicators but also all indicators are essential factors in the design of shopping spaces.

Through IPA, the present study emphasizes things to be considered by designers by considering the user factor, which is the chief part of space during the design process. Therefore, the results constitute a control mechanism for further changes. With the data obtained at the end of the analysis, it will be possible to draw the way for changes and improvements to be made. The study where spatial quality and relationship with user groups are evaluated through IPA by including users in the occupancy evaluation of determining and enhancing spatial quality presents critical information for retail stores. Therefore, with this analysis method, the resulting matrix for quality indicators in retail stores can be developed and transformed into a model proposal. Additionally, the study will be a guide for store managers who are responsible for improving the spatial quality of retail stores.

Retail stores are diversified to serve a wide range and different purposes. One of the limitations of the sample application carried out in this study is that it was made specifically for home improvement retail. Therefore, it is possible to increase or decrease the number of spatial quality criteria to be evaluated, depending on the purpose and function of the sale. Within the scope of the research, the number of evaluated indicators was kept at the optimum level to increase the participation rate of the users in the survey. In future research, applying IPA after classifying the space by sub-sections or functions will lead to give more detailed results regarding the services. Thus, it will be easier to make more effective strategic decisions based on criteria.

In the study, the evaluations were carried out within the scope of joint criteria for all user groups. However, each user's expectations from retail stores and performance perceptions will vary depending on such factors as intended use, frequency of occurrence, and demographic variables. Considering demographic variables is an essential matter, as the quality of the space may have different meanings for different user groups. For example, researchers can study how age groups evaluate the space or how occupational groups interpret it. This research will enable us to clearly articulate the needs, eliminate the deficiencies, and determine the design criteria that should be considered in new space design depending on the expectations of revisiting customer-centered places such as retail stores.

It is believed that the study, which has developed a customer-centered approach by applying IPA for evaluating spatial quality, will offer a

957

different point of view to the literature. One of the most significant advantages which the researchers have intended is to pave the way for further studies by raising awareness of evaluating spaces that serve different functions among researchers and designers.

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Resume

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959

Via Design Focused Thinking Model, Surface Design Specific to Corridors Used By Children with Cerebral Palsy

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Abstract

The design that results from information processing is expressed through the use of numerous visual, verbal, or numerical parameters. Numerous methods, both traditional and contemporary, have been used in design education from the beginning to the present. Design thinking is a model used to represent the cognitive process through which design concepts are developed. Among the experiential learning methods is the design thinking model, which has become popular in recent years. The use of a design-focused thinking model in interior architecture education is reviewed in this study to see what kind of contributions it makes to the emergence of creative ideas. The study aims to increase the student's creative thinking development potential in the design process, reveal concept development skills, develop original design skills, and, as a result, make a cognitive contribution to design education. The study included a total of twelve students from the interior architecture department, divided into three groups. All of the students involved in the research visited the Selcuk University Medical Faculty Hospital Mehmet Emin Bakdemir Cerebral Palsy Treatment Centre, which was chosen as the sample area. After defining the problem, the design-focused thinking method was used to create the wall surfaces of the corridor connecting the physical and treatment rooms, which are used by children with cerebral palsy. The procedure is divided into five stages. By performing various readings on the final designs that emerged, the development of creativity in students was observed. As a result of this study, which was conducted using the design thinking model, it was determined that the concept quality of the projects made increased. As a result, in concept studies where creativity is addressed in design education, it is recommended that the process be managed through experiential methods such as the design thinking method.

INTRODUCTION

Social, cultural, economic, and technological changes from the past to the present have an impact on how people think and learn in society. With globalization, this effect also manifests itself in design education, which aims to teach how to create more identity and qualified design outputs (Onur, 2016). The long-established design discipline has occasionally interacted with other disciplines and derived many methods. Methods developed on the basis of the design discipline can sometimes serve as a model for other disciplines (Boyer and Mitgang, 1996).

Students are taught how to design or how to discover design methods through design education. In disciplines such as architecture, interior architecture, and landscape architecture, design approach methods, which are a necessity of design education, are frequently used. The education process that takes place in design education using traditionally accepted learning or teaching methods limits the individual's creativity because it is not open enough to different perspectives, preventing the emergence of original designs. The level of awareness of this issue has risen today as a result of changing dynamics. Designers are expected to produce unconventional designs that can compete on a global scale while giving aesthetics and functionality a top priority. Design creativity can be revealed through a process in which the individual discovers himself, pushes the limits, destroys familiar assumptions, is directed to mental designs with abstraction and analogies, and the memorization method is not used. With innovative design education models revealed through searches, the level of awareness on this issue is rising.

The most important aspect of design education is to mobilize creativity by focusing on how students can learn rather than how they learn (Dunn and Dunn, 1975). As a result, one of the most important issues in design education is how to develop the ability to think creatively. Many different methods have been developed in this context to reveal creative thinking by supporting it with different perspectives in environments where design education is given, which is considered the centre of design education. In 2004, a center called d.school was established to help students at Stanford University's Hasso Plattner Institute of Design see themselves more creatively and have a series of experiences that change their self-image. The design thinking model can also be used as a method in design education to help students focus on the problem and produce unique results.

The design thinking model can be used as a method in designing all spaces. As a field study, the corridor connecting the physical and treatment halls of cerebral palsy patients was determined as the sampling area in order to strengthen the disadvantaged groups and to enable the designing students to design by discovering people from different demographic structures. The sample area was examined in this study to define the problem, and the size of the space to be designed was determined by the interior architecture department students who

participated in the research. The design-focused thinking method was then used to create a design specific to the function of the sample area. Various readings on the resulting wall surface designs revealed the development of students' creativity. It aims to investigate the opportunities and challenges of designing space based on the use of the original design requirements in the sample area and the design thinking method. Within the scope of the research method, it has been scrutinized what kind of contributions the use of the design-focused thinking model provides in the emergence of creative ideas in interior architecture education, and which is within the scope of the design discipline. The findings of this study are expected to contribute to the design education approach. Furthermore, it is intended to guide design educators and design candidates from a different perspective. Physical and therapeutic procedures have an important place in cerebral palsy, which is seen as a clinical picture that occurs between the early fetal period and the age of five and occurs as a result of brain damage. In the applied physical and treatment process, the physiotherapist's guidance and the motivation of the place in order for the patients to get more efficient results are reflected in the treatment process in a positive way.

Design Education and Creativity

Design can be defined as the process of learning, shaping, constructing, describing, or producing something in one's mind. The ability to solve complex relationships is required for design. As a result, regardless of the product's discipline, design is a long and alternating process with many parameters that must be repeated over and over (Evcil, 2014). Designers, on the other hand, are people who use their abilities such as "process, sensation, perception, thinking, and imagination" to bring the object they have created in their own world to the real level (Tunalı, 2004).

The main purpose of design education is to teach students how to design or how to discover their own design methods (Ulusoy, 1999). The design process, which includes the idea of "creativity," encompasses the processes of "thinking, producing new things, seeing objects or situations from different angles, and acquiring skills". (Beşgen, 2015). In many studies on design education, the importance of using different experiential methods to develop the concept of creativity in designing has been emphasized (Bacanlı et al., 2011; Charles and Runco, 2001 as cited in Kim et al., 2015; Ramm et al., 2013).

Despite being as old as human history, the idea of creativity has only recently become associated with the fine arts, particularly between the 15th and 19th centuries (San, 2004). At the beginning and later of psychology, the concept of creativity was an important research topic in philosophy. Throughout history, creativity has evolved into an interdisciplinary concept that has been attempted to develop in a variety of disciplines such as art, design, engineering, and medicine. According to Wallach and Kogan, creativity is "the ability to generate a large number of distinct associations while not completely abandoning the question"

962

(Jersild, 1983). When we look at the studies on how to develop creativity in design education, we can see that different perspectives and studies on creativity make a difference in creativity theories.

Although creativity in design initially emerges as an idea in the brain, it can be developed and developed later on. As a result, in the educational environments where the design is created, a new formation emerges in which the student assumes responsibility and allows for the establishment of a link between newly acquired knowledge and skills, as opposed to previously acquired knowledge. This emerging formation has brought the student to the focal point and has made it possible to use many different design methods and methods frequently (Kesici, 2019). Aydınlı (2015) notes how important it is to reveal creativity in design education with different teaching methods, and Sayın (2007) mentions that evaluating this situation from a holistic perspective is related to experiential and incidental learning. Tucker and Abbasi (2015), who put forward a similar view, also mention that teamwork is beneficial in revealing multidimensional outcome products.

The understanding of creativity in the design process is in harmony with experiential learning methods. The experiential learning model is successfully used to explore how more effective learning can be realized in every field where design education is provided, to investigate the effects of differentiation in teaching methods and methods on creativity, and to promote the development of methods and skills to deal with problems encountered. When experiential learning methods are used correctly and effectively, it presents a very creative situation for students. It allows students to empathize with a subject, collaborate, and create experimental models during the pedagogical process. It fosters students' abilities to uncover a phenomenon through intuitive thinking and brainstorming, to take risks through collaboration, and, as a result, both inductive and deductive reasoning (Vanada, 2014). Learning the design by experiencing it in the social environment enables the transformation of the learned theoretical data into practice. This transformation harmonizes creative thinking with experiential education.

Design Focused Thinking Model

Design Focused Thinking, one of the experiential learning methods, is an integral tool that can help students develop their critical thinking skills (Razzouk and Shute, 2012). The concept of design thinking first appeared in 1987 and has frequently been chosen as a research topic (Ambrose and Harris, 2009; Brown, 2008; Owen, 2007). The design thinking method has gained popularity due to its suitability for interdisciplinary applications. (Dolata and Schwabe, 2016; Dorst, 2010; Koh et al., 2015; Liedtka, 2018). It has been determined that it is used with various approaches at every stage of education, from primary to graduate level, particularly in education, where the act of design is present. This method provides a result-oriented approach to problem-solving by providing creative solutions to current needs and expectations. In 2004, the Hasso Plattner

Institute of Design at Stanford University established d.school to help students see themselves more creatively and have a series of experiences that change their self-image. This centre has developed a design-focused thinking model that incorporates more traditional sciences such as business, law, medicine, social and human sciences into product design education (Brown, 2008; Pande and Bharathi, 2020). This method is known to be a way of thinking that can be applied in all institutions, from primary schools to the world's largest corporations. Design thinking is divided into five stages, according to this model. These are the stages of empathy: problem definition, idea generation, prototype development, and testing. These stages can be summarized as follows:

- Empathy: Understands their thoughts, feelings, physical and emotional needs in the context of the problem to be solved. This stage involves using a variety of empathy techniques, including 5N questions, relevant person interviews, and user interaction.
- Defining the problem: Focuses on the problem that is framed with clear and clear expressions to solve. Understands the larger social problems associated with a particular problem. In the definition stage, the issue is made crystal clear. People are placed at the centre of the problem definition, a large space is made available for creative thinking, and user empathy, experience, and affinity maps are created.
- Generating ideas: Generates multiple ideas or approaches to solving the problem and saves evaluations of ideas for later. Brainstorming and original solutions are developed during the idea stage.
- Developing prototypes: Creates a quick example of problem-solving ideas that build on each other. Before the design idea is put to the test with actual users, answers are sought regarding its feasibility.
- Testing: Gets feedback. Tests what doesn't work and explores how the prototype can be improved. This phase's goals are to identify what works and what doesn't, evaluate the outcomes, and make appropriate corrections. For this, the user is shown the prototype, feedback is sought regarding the suitability of the product or service being displayed by the user, and improvement areas are identified (Müezzinoğlu & Noraslı, 2022).

964

As a design-focused thinking model, d.school begins with identifying the problem and specifying the context. It then moves on to the empathy stage, in which the people (users) who designed something can be understood. Following the empathy stage, it moves on to the definition stage, where the situation is clarified and the focus is on the design, determining the meaningful challenge to be undertaken. To stimulate the emergence of new ideas, the group of designers must complete the idea generation phase, which includes brainstorming, sketching, or physically doing something that stimulates the emergence of new ideas. The phase

that involves building something that will answer specific questions is then completed after it has been tested with the prototype phase. Finally, the design-focused design process is completed at the stage where user feedback on prototypes is collected (Cantwell, 2019; Design Council, 2021; The Interaction Design Foundation [IDF], 2020).

Because of the parallel relationship between design thinking and creativity, it is clear from the literature review that many countries have incorporated this thinking method into their educational curricula. It has been observed that a curriculum that integrates design-focused thinking processes with academic and professional fields and reveals the individual's skills in education increases creativity in the design process (Goldman, 2002; Education Commission, 2002; Heskett, 2003; Pande and Bharathi, 2020). Using the design-focused thinking method to address a social problem such as creativity is essential for reviewing academic studies in the field and guiding future research. The following are the findings of some studies on the effect of design thinking on creativity.

Students who are encouraged to use the design thinking method are seen to be more open to the process, have clearer learning outcomes, and complete the design process more quickly (Assaf, 2009). Wrigley and Straker (2017) looked into how design thinking methodology affected how well undergraduate students learned in 51 different courses offered at 28 universities. An "Educational Design Ladder" with levels for products, projects, businesses, and professionals has been developed in the study. The study's findings have shown that design thinking is a crucial technique for identifying differences in methodology. The research by Luka used a similar methodology (2014). The study's findings highlighted the importance of the human-centred approach as a key differentiator in the final product when approaching problems through design-focused thinking. According to Moirano et al. (2019), there exists a growing trend for creative cross-disciplinary collaboration using the design-focused thinking method. On the other hand, Lindberg et al. (2010) looked into how the design thinking approach can enhance cross-disciplinary collaboration. The study has highlighted how the process of experiential learning with design-focused thinking makes it simpler for the designer to discover himself. Most studies claim that people possess the skills needed for design, but when the design thinking method is actively applied, people can develop the skills needed to solve problems that call for creativity and have an impact. The application of the design thinking methodology is growing daily, and it is becoming clear that it is a crucial tool for the training of designers for the twenty-first century. When combined with the appropriate techniques, the design-focused thinking approach equips designers with the skills necessary to successfully address the ever-evolving challenges that the global society will encounter in the future (Cantwell, 2019; Koh et al., 2015; Teixeira, 2010).

965

Spatial Perception in Children with Cerebral Palsy

First off, the space, which includes the constricting locations made by nature, has been used by being specially designed over time in accordance with user requirements. As a result, space has always been crucial to the continuation of life. Restricted areas where people can feel safe are always needed (Proshansky et al., 1983). Space is described as the space that controls how people live, the space that somewhat isolates people from their surroundings and permits them to carry on with their activities (Hasol, 1993). Man first displays his behaviour by recognizing his surroundings. To the extent that it can perceive the space, this behaviour becomes more efficient.

The perception of the space can be used to explain the characteristics of spaces that are designed to meet the needs of the user. Humans experience and interpret space using their senses, and they feel and understand things by connecting them. Perception is a component of numerous cognitive processes, including reasoning, imagining, and associating, and it varies depending on the individual's cognitive make-up (Goldstein, 2010; Hart and Moore, 1973). By providing a stimulus to the senses, the environment can influence how perception is formed directly or indirectly. In addition to the stimulus, perception also responds to differences in the environment and an individual's current circumstances (Cutting, 1989). As a result, the personal characteristics of the individual, such as culture, age, and health issues, as well as the environmental characteristics of the space, influence how the space is perceived.

The interaction between human and the environment is a result of how individual experiences the world through their senses. This interaction is best described by Pallasmaa (2018) as follows: "While the space reflects its distinctive features, the person who experiences it also transfers his/her own feelings and perceptions to the space, that is, the user interacts with the space." It is an information-gathering procedure in which spatial perception, environmental stimulus, and spatial experiences are all combined and understood in light of how the user interacts with the environment. It can be exhibited throughout the entire warning, sensation, perception, and informatics process. The environment's stimulant effects are first detected by perception, after which they become information and are retained in long-term memory. Although the senses are used to perceive space, the organ of vision takes on the most significant role. Therefore, visual stimuli are the first physical stimuli to emerge in the perception of space (Güller, 2014).

Health structures should be made perceptibly because they are very comprehensive. Hospitals are large, multifaceted structures that serve many different user groups, including patients, visitors, and medical professionals. Children's hospitals, on the other hand, are defined as healthcare facilities where children between the ages of 0 and 18 are recognized, diagnosed, treated, and recovered from. It is possible to see that children's hospitals can be divided into two categories when

966

967

examples from around the globe are considered: hospitals with all medical departments and hospitals focused on a particular medical branch (Arık, 2019).

These structures are broken up into a great number of tiny cellular spaces. Such spaces or circulation areas that offer inter-space relations are challenging for users to experience, perceive, and move through (Allison, 2007; Güç et al, 2013). The design of children's hospitals should take into account not only the needs of young patients (0–18 years old) but also those of their companions. It is also important to keep the needs of young patients apart from those of adult patients in the medical field, which is undergoing continuous development and change (Dikmen, 2012).

Hospital settings can be frightening, especially for young patients. As a result, hospitals are occasionally thought to be stressful for kids. Fear and anxiety brought on by poor hospital environment design can also result in behavioural disorders (Nasab et al., 2020). As a result, when designing the space, it is important to keep in mind that the user group includes children between the ages of 0 and 15, whose aesthetic, physical, and psychological preferences will change over time.

On the other hand, designs can be created for perception detections brought on by diseases for kids with various illnesses. Interviews were conducted with patients, their families, and nurses to learn more about the colors and patterns they would like to see in the Sheffield Children's Hospital waiting area. In the waiting area, colors that wouldn't frighten children with autism were used after taking into account the likelihood that they would be among the hospital's patient (Arık, 2019). In areas where children with specific and chronic diseases are continuously treated, this circumstance occurs more frequently.

A known progressive or degenerative brain disorder that develops as a result of central nervous system lesions, damage, or dysfunction in the early years of life is known as cerebral palsy, which is a specific disease. Accordingly, cerebral palsy is thought to be a non-progressive permanent loss of motor function that affects movement, posture, and movement disorders. It results from damage to the developing brain during the fetal or infantile period (Öneş et al., 2008). Depending on how much of an impact cerebral palsy has had on the mind, different people may perceive space differently. According to the definitions of cerebral palsy, because of the disease's conscious subjective state, how a patient is treated will depend on how they perceive it. spaces with individualized design elements that encourage children with mental or physical disabilities to live their lives by allowing them to spend time learning and having fun like other kids without feeling pressured or excluded from society (Uslu and Shakorui, 2012). The therapeutic quality of quality spaces becomes apparent when taking into account the psychological state of children with cerebral palsy in the setting where they are treated.

The factors that directly affect the legibility of health buildings are the quality of the corridor design and the user's characteristics (Ünlü et al.,

2008). Walking through long corridors to get somewhere can be tiresome. Users feel anxious because they can't see the end of the corridor or are unsure of where to exit while driving (Kazanasmaz, 2004). As a result, it is crucial to design the spaces where children are treated as well as the passageways that properly and visibly link the spaces together.

While traffic on roads is described as the fluidity of water, circulation is the movement of people inside a structure. On the other hand, the circulation area is the space occupied by building features like ramps, stairs, and corridors that connect different volumes (Hasol, 1993). The quality and originality of the designs used in the circulation areas greatly influence how the space is perceived. The unique designs that were created for the corridors in this setting strengthen the feeling of community and give the area an identity. Circulation areas that link the spaces can be both physically present and conceptually represented by a volume or surface value (Canbakal Ataoğlu, 2009).

Due to their vertical orientation, wall surfaces are the most visually effective surfaces for defining space (Ching, 2002). Wall surfaces are therefore superior to other surfaces in terms of enhancing interior perception. By sending certain visual messages to the users of the space, designers give the environment a certain personality. As a result, the associations made by the environmental stimuli influence how the user perceives, thinks, and behaves concerning the environment. The majority of the messages to be delivered are loaded on the interior's vertical surfaces (Aydıntan, 2016). Numerous factors that contribute to the space's construction also have an impact on how the space is visually perceived by the individual. The space is made up of design components in this work of fiction (Yılmaz, 2004). In interior design, surface designs contribute to the formation and organization of space by utilizing elements like color, texture, material, and light. Over time, this formation solidifies and gives the location a name (Okuyucu and Çoban, 2019). Functional, physical, and aesthetic expectations for the space are very high, especially in locations that offer treatment services for particular diseases. The designed spaces are unique and qualified because the designers accurately translated these expectations into the spaces.

METHOD OF THE STUDY

In the context of the Health Buildings course that they took in the fall semester of 2022–2023, this study was conducted with the senior students of Selçuk University's Faculty of Architecture and Design, Department of Interior Architecture. Design-focused thinking methodology was employed in the study methodology to emphasize creativity in the created designs. The first-floor corridor of the Mehmet Emin Bakdemir Cerebral Palsy Treatment Centre at Selcuk University Medical Faculty Hospital was chosen as the sample area for this study. The corridor between the physical and treatment rooms is 147 m2, as

968

shown in **Figure 1**. The building is 280 cm tall. As a result, the space has two 273 m2 wall surfaces on the right and left.
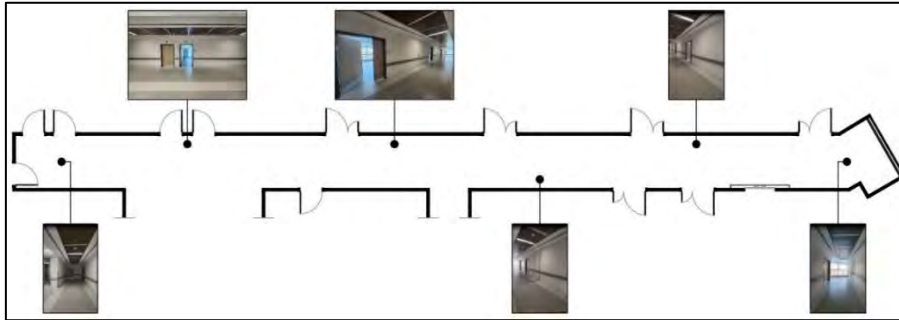
Over the study's sample area, three different surface designs were displayed. The projects were carried out in groups of four, with a total of twelve students. Every stage of the design thinking model used in the study's methodology aims to establish a process environment that will safeguard the quality of the work to produce a successful outcome by illuminating the subsequent stage. The five stages of "empathizing, defining, generating ideas, developing prototypes, and testing," which are the chakras of the design-focused thinking method, were used to create the designs realized within the parameters of the stated purpose and method, as shown in **Table 1**.

Table 1. The process of studying according to the design thinking model.

Stages	What's been done
Empathy	Explaining and examining the subject and process.
To identify	Creating the word cloud for users in the venue.
To generate ideas	Writing design scenario with word cloud constraint.
Developing a Prototype	Designing wall surfaces within the scope of the scenario.
To test	Analysing the designs made at the level of originality.

The students who first examined the sample area were given the opportunity to draw conclusions and develop an understanding of the users within the framework of the method developed in accordance with the design thinking model. The corridors connecting the spaces are intended to be experienced while waiting in the areas where children with cerebral palsy are treated to determine what is needed visually in the surface design in this situation. According to the study's methodology, it served as a guide for defining the issue in the second stage after establishing empathy in the first. Limitations were set with the word cloud in the second stage, and the project was deepened with the next stage's writing of the design scenario. As a result, textual guidance was provided before visualization for the word cloud, design scenarios, and prototype designs produced by the groups in the second and third stages. A prototype was created by designing the corridor where children with cerebral palsy wait while receiving treatment after thoroughly analysing

all of the data. As a result, the lecturer conducted a descriptive analysis of the designs created in the fourth stage in the final stage.

CONCLUSION AND EVALUATIONS

The stages of empathy, definition, idea generation, prototype development, and testing were used to analyse and evaluate the results obtained using the study's methodology. These stages were discussed in accordance with the design thinking method.

• Stage One: Establishing Empathy

To empathize in the setting where the study would be conducted, information about the subject was provided and investigations were made in the first stage of the study. Measurements of the area and the existing corridor were determined. Following the one-to-one experience of the sample area, all group members discussed the results based on the observations and communications made collectively. The treatment procedures for children with cerebral palsy and their roles and expectations in the environments they use served as a means of fostering empathy in this situation. The group members' ability to empathize ensured that the study's targeted limitation was clearly defined. By taking into account the demographics of the users of the space and adopting their cognitive and behavioural abilities, the design students who initiated the design process used the space similarly to them.

As a result of observations and empathy, knowledge about what cerebral palsy children enjoy, how to motivate them, and how they unwind provided the problem's concretization before it was defined. Accordingly, it has been discovered that physicists and therapists with dreams of flying in the sky, running in nature, or swimming in the sea motivate children with cerebral palsy while they are receiving physical therapy. Children with mild cerebral palsy enjoy painting and reading stories, and many of them are fairy tale heroes, according to research. Additionally, it has been found that kids with cerebral palsy enjoy chatting and playing to socialize.

• Second Stage: Identify

In the definition phase, which follows the problem's identification and assimilation, the goal is to describe the situation more clearly and simply. When children with cerebral palsy were being treated in the early stages, activities like walking in nature, flying through the air, swimming in the sea, loving animals, and going for a stroll with fairy tale characters were generally excluded from the registry and used to refer to definitions. As a result, the notes taken while experiencing the space in the first stage were condensed, replaced with words that placed more emphasis on them and guided during the definition stage.

Student teams identified keywords to represent the images created following the information obtained and reflect them on the design by giving them more authority. As shown in **Figure 2**, the extracted keywords were discussed, gathered into a single pool, and expressed

970

using the word cloud technique. In a meeting that included all of the group members, the keywords that each group had independently proposed were combined. Following that, similar-sounding words were combined, made simpler, and gathered on a single platform. With the definition phase occurring before the idea generation phase by choosing the words determined for the subject of the project, the images formed by the verbal concepts started to settle in the mind within this platform, which we define as the word cloud. As a result, the information that will determine the projects' concepts was gathered, and the information obtained for the design was defined. The words created for the examined space, the users, and the targeted design images have been simplified and given a concrete form to generate the idea for the study's topic. It has been found that defining the issue in terms of potential solutions gives designers crucial convenience when coming up with a design concept.
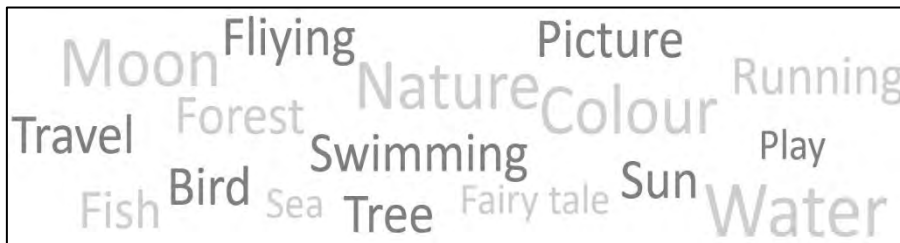

Figure 2. Word cloud created by students.

• Stage Three: Generating Ideas

After the phases of definition and empathy, the collected data were assessed, and the idea generation phase was launched by creating a design scenario. At this point, all actions taken to generate ideas were completed. The designer is guided and assisted in the process by using a scenario—either one that already exists or one that is created—to generate ideas and lay the groundwork for visual design. The concepts in the word cloud, which were derived during the definition phase, served as a guide for the creation of the design scenarios in the idea generation phase. For the written design scenario, each group separately chose a keyword from the word cloud and then created a design scenario based on these words. At this point, the groups were divided and a foundation for the design of three distinct projects was created. As can be seen in **Table 2**, the introductions to the design scenarios were thus created using the keywords that were found in the word clouds of three different groups. Accordingly, the keywords from the word cloud of three different groups were determined by the coordinator and the students participating in the study with their closest connotations and they created the introductions of the design scenarios.

Table 2. Development of the design scenario.

Groups	Keywords	Introduction of the design scenario
1st Group	Story, Travel, Tale Hero.	A fairy tale hero's adventures on various journeys make up the scenario. Wall surfaces are therefore decorated with various images, including those of space, a camp, a farm and rain. By linking the surface of each depicted wall with the specified QR code and including a personal photo in the system, it offers the chance to experience the adventures with the hero in a virtual setting.
2nd Group	Water, Seas, Season.	The design scenario was created based on the therapeutic power of water. As a result, the design of the wall surface featured fish, underwater images, and the calming qualities of the beach. By using the projection mapping technique to reflect the seasonal changes in the virtual environment, the flow of life is further explained.
3rd Group	Nature, Animal, Play.	The study's central themes are nature and the animal kingdom. It shows a variety of wild animals swimming, flying, and running. Additionally, themes were developed while people were waiting in the hallway to teach children with mild cerebral palsy how to count, learn colours, and categorize surfaces according to dimensions.

• Stage Four: Developing a Prototype

The wall surface design and prototype were created by converting the concepts generated by design scenarios into images on the surfaces. It can be seen that the wall surface designs serve as the foundation for the design scenarios where the dynamics of the keywords are created. Accordingly, the various locations where the study team's imagined fairy tale hero went on a stroll were visualized and described with a surface design in the form of a story in the wall surface design that the first group created by taking into account the concepts of story, travel, and fairy tale hero. Based on the healing properties of water, the second group created surface designs using the ideas of water, sea, and seasons. These designs included images of the ocean floor, the coast, and seasonal changes. The ability of living things to swim, run, and fly was referenced in the wall surface design that the third group created by taking into account the concepts of nature, animals, and games to visually express the images that such movements will provide motivation during the treatment process. As shown in **Table 3**, wall surface designs are expressed as appearances in the digital environment. It is clear that the information that provides the motivation of children with cerebral palsy is taken into account at the stage where designs are made for the problem and the solution is addressed with prototype development. In this direction, wall surface designs based on ideas like fairy tales, games, nature, and water were carried out at the prototype development stage. These ideas were revealed as a result of observations made while the children were being treated and waited on.

972

Table 3. Wall surface designs prototyped by students.

The wall surfaces, the prototypes of which were developed, were designed by drawing in accordance with the original of the space. An application-focused prototype has been created, taking into account components like wallpaper or interior wall paint. While the first group's prototype depicts the locations visited by the story's protagonist on the right and left wall surfaces, the second group arranges the healing properties of water by showing an underwater scene. In the third group, nature and animal images were used to create the prototype that was developed with interrogative and instructive texts.

- Stage Five: To Test

The instructor used the design-focused thinking method to complete the testing phase, which is the last step in designing the wall surfaces of the corridors that connect the physical therapy treatment rooms for children with cerebral palsy. The designs based on interior architecture were assumed to be made in accordance with the established methodology during the testing phase. In this situation, the project group prototypes were accepted as the final product, and the entire process was evaluated following the method's stages. The following are the evaluation criteria that were taken into account:

- At the stage of establishing empathy, the acquisition of existing data and the development of detecting the problem,
- In the identification stage, the data can be made concrete by revealing,
- Establishing a connection with the design by analysing the data during the idea generation stage,
- General evaluation of the technical accuracy, conceptual compatibility and design quality of the result that emerged during the prototype development stage.

The first group uses a story based on a fairy tale hero to represent the places they visit on the wall; the second group arrived at a design solution by using the healing qualities of water and depicting undersea and seasonal changes; the third group, on the other hand, used the prototype development by using a love of nature and animals to demonstrate that

the steps work. Because of this, the three groups' design stages involved empathic perception and definition of the problem, simplification of definitional concepts, writing of limiting descriptions, the establishment of a quality connection between the text and the visual design, original and qualified action, and creation of a prototype.

The designs are more readily embodied by developing empathy through on-site observation and data analysis, it has been observed based on the overall assessment made taking into account the aforementioned criteria. The process of creating a word cloud from the keywords that the groups generated increased the speed and improved the quality of the designs that were created on the wall surfaces. In general, it has been noted that original designs are taken into account, some data will boost cerebral palsy patients' motivation during treatment, and designs are made by taking into account the furnishings in the space.

The goal of design is to solve a problem. The person or people who are experts in their field and have received design training are the ones who can solve this problem. The process of designing the problem and then arriving at a solution entail going through several stages. One of the biggest challenges in the design process is conceptualizing the design and accurately transferring it into a prototype. In light of this issue, conventional approaches to design education fall short. Such issues harm the quality of the finished products and the concretization of concept ideas. In design education, unrestricted individual or group projects tend to resemble one another by straying from originality. As a result, the prototypes that appear during the design education process without being based on a methodology deviate from quality. Additionally, it might make a design student who places more emphasis on the result less motivated. It is advantageous to manage the process using techniques that have been scientifically validated so that the created designs can be realized without any issues per the targeted purposes. The methodology of design thinking is the one used in design education that contributes to the process the most.

974

Five stages make up this study, which was conducted using the design-focused thinking methodology. Making observations by looking over the sample area on the spot helped define and assimilate the problem in the initial stage of empathy, boosted project ownership, and created an inspiring environment for concept ideas. In the second stage, the designs could become more enriched and multidimensional thanks to the definition, analysis, and open discussion of the data among all project groups as well as the combining of the emerging concepts into a single word cloud. As a result, the design scenario developed for the concepts selected from the word cloud during idea generation, the third stage, has served as a very explanatory manual for the project's design. The final products were created and finished in accordance with the determined subject's original value during the fourth stage, prototype development. In the final testing stage, it was determined whether the projects created within the given constraints create a qualified design sample.

These findings largely accord with those of the studies conducted by Goldman (2002), Heskett (2003), Luka (2014), Pande and Bharathi (2020). By using the design-focused thinking methodology to create the wall surfaces of the corridors connecting the physical and treatment rooms for children with cerebral palsy, the capacity to reveal original and creative ideas in design education has been developed. As a result of the data obtained from the study, in the design made with the design-focused thinking method; it is seen that it is possible to obtain, process and transform the data into the final product, facilitating the design process. The quality of the projects completed in relation to the concept has improved as a result of this study conducted using the design-focused thinking model (d.school). In light of this, it is advised to manage the process using experiential techniques like the design-focused thinking method in concept studies where originality and creativity are discussed in design education.

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977

Resume

Mehmet Noraslı received his degree from the Interior Architecture and Environmental Design Department of Selçuk University's Faculty of Fine Arts. After completing his master's degree at Selçuk University and Hacettepe University Joint Master's Program, he completed his doctorate in the Department of Architecture at Karatay University. At Selçuk University's Faculty of Architecture and Design's Department of Interior

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978