Journal of
Design Studio
v:5 n: 2 December 2023

Spatial Organization Approaches at the First-Year Design Studio

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Research Article / Received: July 13th 2023, Revised: September 17th 2023, Accepted: September 21st 2023
Refer: Yildirim Coruk, I., (2023), Spatial Organization Approaches at the First-Year Design Studio, Journal of Design Studio, V.5, N.2, pp 195-205.
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DOI: 10.46474/jds.1327100 https://doi.org/10.46474/jds.1327100

Abstract: The space, that the raw material of design studio contents in disciplines related to spatial design, is a delimited space in the simplest terms. The totality of relations created in this delimited volume is associated with certain organizational form, such as central, linear, clustered, gridal and radial. This study aimed to investigate those organizational forms based on student process outputs of 17 students, completed the Design Studio-I course during the 2022-2023 Fall Semester at the Department of Interior Architecture and Environmental Design at Fenerbahce University. Also it is aimed to created a space fiction by using basic design elements and to reveal student approaches in this process. The study was designed with qualitative research method and content analysis was used as the data collection technique. In this direction, the process stages and outputs performed by the students for the given problem in the studio environments were analyzed. As a result of the analyzes, the form analysis of the two-dimensional photo frames by using the design elements and the transformation process of this analysis into the space organization has been revealed. Thus, an application for the way of benefiting from design elements in the process of space organization has been showed.

Keywords: Spatial design education, Design studio, Space, Spatial organization forms.

Introduction

First-year design studios provide the students with an environment, where they can do their first exercises in spatial design, and it may include abstract or concrete spatial work. Accordingly, students have their first experiences with space, and learn spatial relations and spatial organizations. Upon a review of the previous studies investigating the students' spatial organization approaches in design studio environments, Hasgül and Birer (2019) established the aforementioned relationship on the basis of Bauhaus posters. In that study, students were expected to analyze the stylistic relationships in the designated posters, followed by reinterpretation upon synthesis of the form relationships in the posters. Therefore, different spatial interpretation styles of students were investigated in the resulting products. In another study, Özsırkıntı Kasap and Türkmen (2018) investigated formal organization relations/form production approaches of students using basic geometric forms and design principles during the transition from two-dimensional surface to three-dimensional volumetric studies in basic design education. Furthermore, Özsırkıntı et al. (2019) also aimed to explore the spatial organization approaches of the students at basic design education studio environment. Here, the geometrical decisions – based on defining the organic forms also associated with the biomimicry discipline– and the three-dimensional volume expression of those decisions were investigated.

This study has created in order to contribute to the relevant literature on the subject rather than the deficiencies in the existing studies or the search for answers to the problems in the literature. Like other studies, this study was conducted in the first-year design studio environment. The motivation of the study is to create a space structure by using basic design elements in the design studios in the first year and to reveal the student approaches in this process.

Accordingly, the students were asked in the studio setting to take a photograph with a focal point from a defined area and this frame was limited to 25*25 cm. In this process, the photo framing is expected to be determined by the student himself. Because this determination also prepares the ground for the student to question what the composition is, to determine the elements that will form the composition and to discuss the relationship between the elements. Subsequently, the totality of formal relations that constituted the focal point over the relevant frame were expressed in the 2nd dimension by using the design elements of point, line, and surface (plane). In other words, the language of relationship in the photographs was analyzed and reflected by design elements. During the study, this type of relationship was transformed into volumetric relationships in the third dimension, and abstract spatial outputs have been revealed. At this point, the aim of the study is to reveal the process experienced in the studio environment and the outputs of this process, the ways in which the basic design elements were utilized in the space fiction and the spatial organization tendencies of the students.

Whereby, the abstract spatial formation approaches of the students were reviewed by means of formal analysis of the existing relations over the two-dimensional photo framing taken from a defined and concrete space. The study is thought to be a contribute to the literature because it exemplifies the way design elements are utilized for form analysis and space organization formation. This analysis study, which is carried out by using design elements, is important in terms of determining the form analysis and space organization tendencies of the students, comprehending the design elements, developing their spatial abilities in terms of providing analysis, synthesis and three-dimensional relationships through these elements, providing awareness about the organization of space and providing rational data on this subject by ensuring the traceability of the process.

Theoretical Framework

Space, as defined by Hasol (2010), is a gap that separates people from the environment to a certain extent and allows them to continue their activities. Namely, it is a three-dimensional setting, which includes the arrangements for the movement and behavior of the individual and is based on coexistence of width, depth, height, distance, and spacing. Space is a conceptual existence that is perceived not only by our physical existence or actions, but by all the senses as well. It is composed of a combination of the sensory and aesthetic characteristics of all the elements it contains. Therefore, it is not only defined in formal and dimensional terms, but also considered within broader contents (Özkan, 2017).

The notion of space connects the cultural and the mental, the historical and the social. It is a complex process with regard to discovery, production, and creation. This is based on the material embodiment of the process elements (Lefebvre, 2014). Architectural/interior design education is associated with visual-spatial skills and competencies along with the aforementioned space notion. Students are introduced to both design and visual representation tools during the first year of that education. This process, in which the student starts to design, is characterized by how the students think while designing, how they can use their visual spatial skills, and how they can take further steps to ensure development. Thus, a first-year design studio student has to understand both the design process, and the space, which is the essence of that process, while assuming increasingly complex design tasks (Acar, Soysal Acar, & Ünver, 2019). In doing so, different methods are used.

During the first-year design studio, the design process is envisaged through abstract works, and thus it encompasses formal concerns along with their conceptual framework. In that regard, the space, which is expressed as gap with a function and vest new identities to architectural/interior design education, also allows for inquiries that would shape the search for form in design studio environment. In addition, the first-year design studio plays an important role in the development of spatial skills and three-dimensional expression ability, which would allow the students to consciously observe the physical environment and to produce reflexes in line with those observations. As well as the above objectives, the first-year design studio students can produce solutions to formal and fictional problems in the design process (Özsırkıntı Kasap, Türkmen, & Basarik Aytekin, 2019). In this study, these solution proposals are examined by considering Ching spatial organization approaches such as centralized, linear, radial, clustered and gridal approaches.

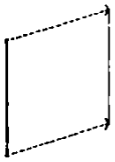
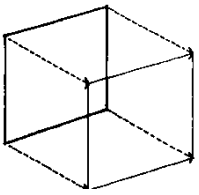
In order to produce these solutions, the topics included in the design studios in the first year are generally the headings that form the basis of design and space organization such as design elements, design principles, visual perception principles. Within the scope of the study, among these headings, design elements are focused. Although design elements are handled in different ways in different sources, in this study design elements are handle as point, line, plane, volume, light, color and texture (Güngör, 2005). But, only point, line, plane and volume (Table 1) have used in the analysis process.

A point determines a position in space. Conceptually, it has no length, breadth and depth. It is therefore static, directionless and central. The point is the smallest element that the eye can perceive. It is a feature that does not specify any direction, has no dimensions, and does not have a visual value on its own. (Gürer, 1990). When it is stretched the point becomes a line. The line has a length, but it does not have a width and height/depth. As a design element, the line is a visual value that does not have a surface and volume effect on its own, but follows thin, long and certain paths according to its location (Tepecik & Toktaş, 2014). While the point is stationary by nature, when the line describes the course of the point in motion, it can visually express direction, motion, and growth. When a line is extended (in a direction other than its own), it becomes a plane, the plane has length and width, but no depth. The plane, extended in a direction other than its own direction, becomes volume. Conceptually, volume is three-dimensional. Length, width, and depth (Ching, 2011). Points make up the line, lines make up the plane, planes make up the volüme (Atalayer, 1994). This elements harnessed for spatial organization in this study.

The physical explanation of color is made as 'absorbing some wavelengths depending on the properties of the objects and reflecting some of them' (Seylan, 2005). Texture is a special quality that a surface has due to its three-dimensional structure. Texture is mostly used to describe the roughness and smoothness of a surface (Ching, 2011).

The processes of architectural and interior design education that require visual spatial

Table 1: *Design elements (Ching, 2011).*

Point	Line	Plane	Volume
			

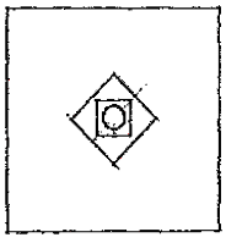
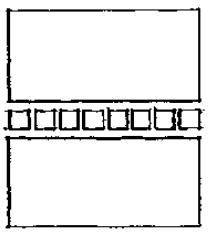
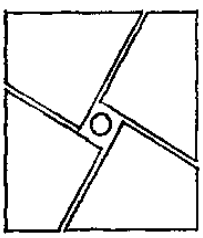
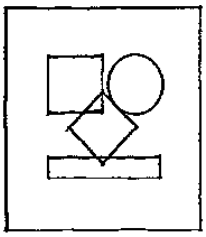
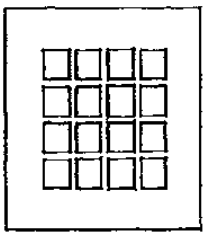
awareness and skills are among the basic topics in the field of spatial design. Therefore, visual-spatial competencies and skills that students are expected to acquire and develop during education are significant for the purposes of the relevant literature (Acar, Soysal Acar, & Ünver, 2019). Associated with spatial design, architecture and interior design students are expected to abstract the space they perceive into its components, and then transform those components into two- or three-dimensional forms of expression by means of visual expressions. Accordingly, the spatial patterns created with an aim to address the problems related to the spatial design can serve as an input to the spatial organization design (Hasgül & Birer, 2019). In this study, the separation of the space into its components and the subsequent creation of three-dimensional spaces were realized by using design elements.

"In the first-year design studio studies aims to promote creativity based on abstract and conceptual thinking and induces presenting a product both in theoretical and organizational terms based on basic concepts. In the context thereof, the process of creating a new holistic result, which the students have created for a defined problem, constitutes an important opening in terms of introducing the grounds for architectural spatial design after the first year (Hasgül & Birer, 2019, s. 39-40). Furthermore, form relations, which organize the ideas superficially produced in the volumetric scale and make the spatial approaches on the plane traceable, allow the intuitive, analytical, and spatial preferences of the students to be represented in a three-dimensional environment (Türkmen, 2020, s. 233)."

The creation of the whole upon bringing the objects together is a consequence of the search for order in the spatial setup. Ching's classification of spatial organization is considered in this context in explaining the organizational chart, layout, and form of architectural space. This fiction constitutes a classification based on reading the search for form in spatial design through diverse compositional schemes (Hasgül & Birer, 2019). Association of spaces with each other by virtue of spatial organization approaches in design provides ways to create form and space patterns (Özkan, 2017). Ching suggested five approaches (Table 2), namely central, linear, radial, clustered and gridal organization as regards the spatial organization approaches.

Centralized Organization: Central forms refer to organizational relations that mark a point in space or indicate the center of a defined space (Yollu, 2006). Centralized organization is a composition of several secondary spaces around a central, large, and dominant space (Ching, 2011). This organizational approach is associated with spatial hierarchy. So, the most important space is located in the centre and surrounded by secondary ones (Eskandari, 2011).

Table 2: *Spatial organization approaches (Ching, 2011).*

Centralized Organization	Lineer Organization	Radial Organization	Clustered Organizastion	Gridal Organization
				

Linear Organization is established by introducing associations between directly related or different linear spaces. This organization is formed by the bringing together spaces that are similar in terms of size, function, and form. Symbolically or functionally important spaces in linear organization are underscored by distinctive sizes compared to others (Yollu, 2006). Although linear organization is usually made of repetitions of similar elements, they can also occur differently in terms of size, form, and function (Özkan, 2017).

Radial Organization is created by the radial extension of the linear spatial organization (Ching, 2011). This organization is marked with a dominant, central point from which a number of linear organizations radially extend outward. The radial arms may be distinct from each other to meet the requirements of function and context (Yollu, 2006). The radial spatial organization combines the elements of both central and linear spatial organization. Accordingly, there is a central and dominant point, where a large number of linear elements are positioned radially outwards. While the centralized organization form gives a rise to an introverted schema, the radial organization creates an extroverted schema due to the outward-extended elements (Özkan, 2017). In brief, the radial organization approach has formed by the combination of central and linear organization relations.

Clustered Organization is characterized by the repetition of spaces that share a common, visual feature, including a similar function, form, or orientation (Yollu, 2006). This organization is associated with groups created on the basis of a common relationship, shared visual character, or proximity (Ching, 2011). Clustered organizations use the proximity of those spaces to associate their spaces with each other. Those organizations often consist of spatial repetitions with similar functions, shared visual character, such as shape or orientation (Ching, 2011). In this organizational approach, since the pattern of elements is not rigid and limited, it is flexible and open to change.

Gridal organization includes spaces and forms, the spatial positions, and relations of which are organized by a three-dimensional grid pattern (Yollu, 2006). That organization is created with spaces organized within a structural grid or a different framework (Ching, 2011).

In order for these organizations to occur, design elements and principles, which are the main components of design education, are utilized. In the study setup, it was expected to use design elements in the process of revealing the spatial interpretation forms of the students and to create a three-dimensional space organization from these analyzes. With the study created in this direction, the analysis process and spatial interpretation approaches experienced by the students were revealed. Although the design elements are grouped as points, lines, surfaces, volumes, colors, lights, textures, in this study points, lines and surfaces are as primarily used. Since the exercises for color and texture, which are among the design elements, were also included in the intermediate stages of the study, these elements were reflected with in the use of color or texture in the final products.

Method

This study was designed with qualitative research method. Content analysis technique was used for assessing the obtain data. Content analysis is a systematic and empirical method intended for the analysis of document type of data. This method can also be used to analyze audio-visual materials, although it is generally used for the purposes of written data analyses (Burton, 2000) (Groat & Wang, 2013).

Accordingly, in the study, it is aimed to make form analysis by using basic design elements and to transform these analyzes into three-dimensional space fictions. In this study, as a data source, the student studies of the design studio in the department of Interior Architecture and Environmental Design of Fenerbahce University in the fall semester have discussed. While analyzing the data, the student study steps showing the analyzes provided by the use of each design element have sampled and revealed with the process outputs. The

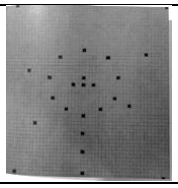
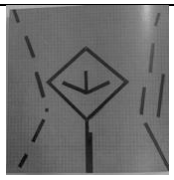
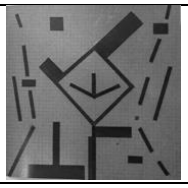
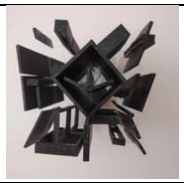
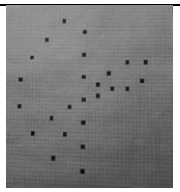
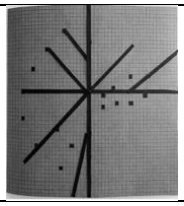
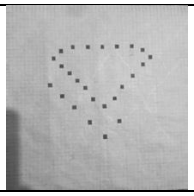
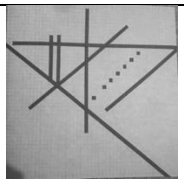
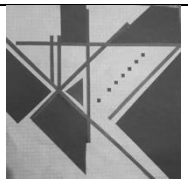
participation of the students in the process was ensured by performing the relevant steps for the given problem. The analysis of the data was obtained both by how the two-dimensional relationship language in the photo frames was analyzed by using the design elements and by classifying the resulting products to which of the spatial organization approaches could be included.

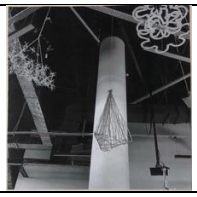
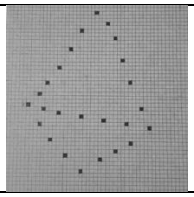
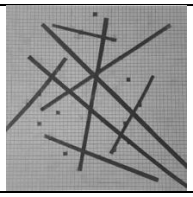
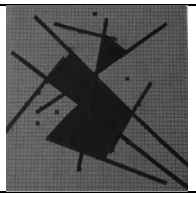
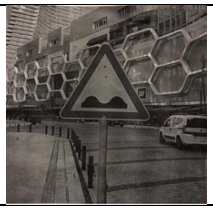
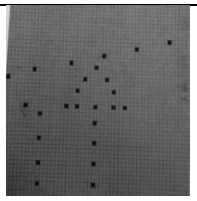
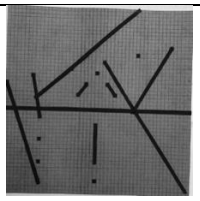
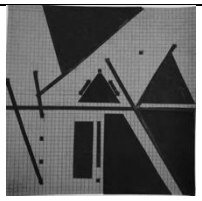
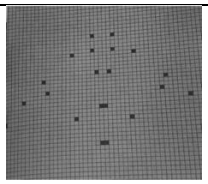
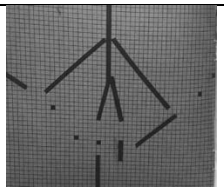
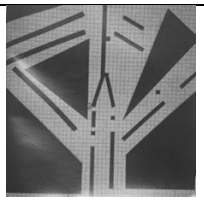
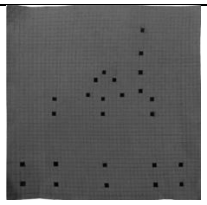
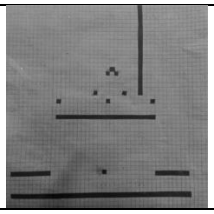
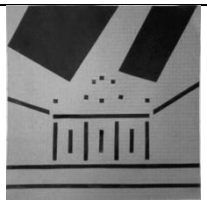
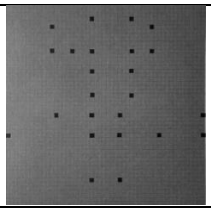
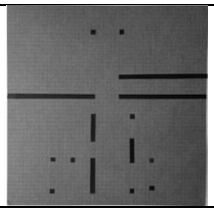
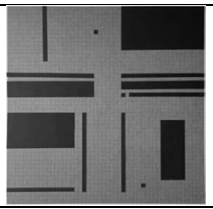
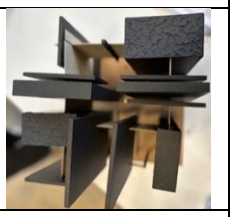
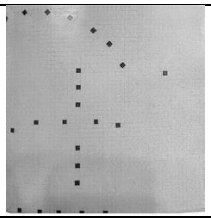
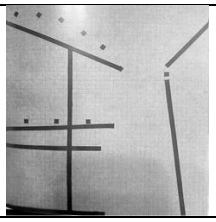
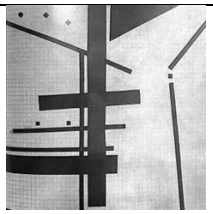
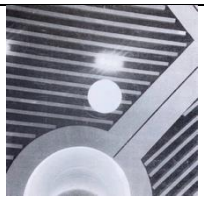
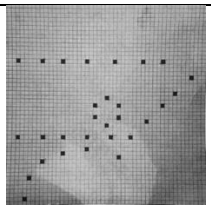
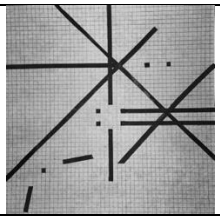
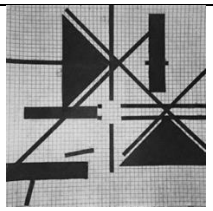
In summary, this study was conducted with 17 students, who successfully completed the design studio course at Department of Interior Architecture and Environmental Design, Fenerbahce University, during the fall semester of 2022-2023 In the study, students were expected to analyze the form relations that form the starting points they are based on through design elements and to create a three-dimensional space organization as a result of these analyzes. In the course thereof, the work began with a 25*25cm photograph frame taken from a defined space and with a defined focal point. During the next step, the students were anticipated to analyze the relational code of the focal point in the photograph through the design elements of point, line, and surface, and to present a two-dimensional composition based on that analysis. Thereafter, the counterpart of the said relations in that composition was sought in the third dimension and abstract spatial volumes were presented. The spatial organization approaches in the final products of the study have grouped by using the spatial organization classification of Ching (2011) in order to reveal the spatial organization tendencies of the students.

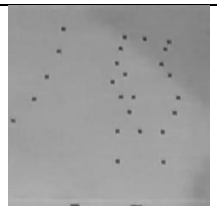
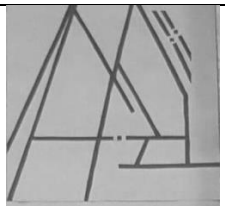
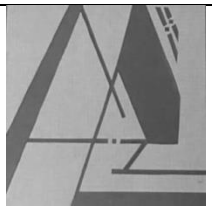
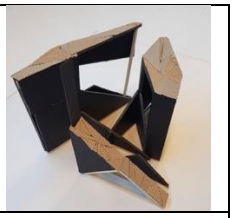
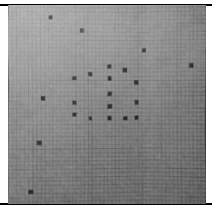
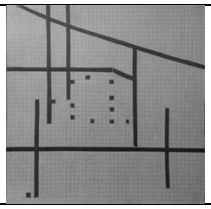
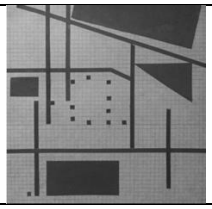
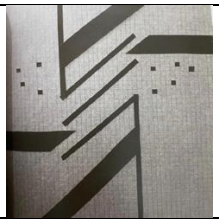
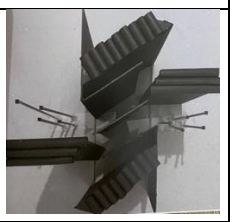
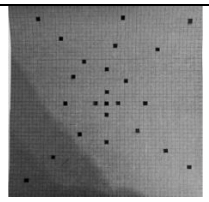
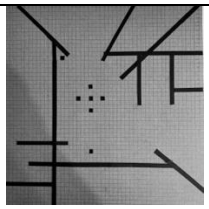
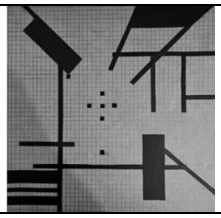
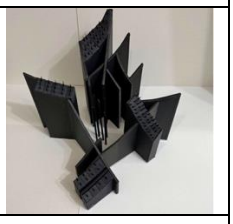
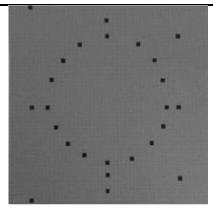
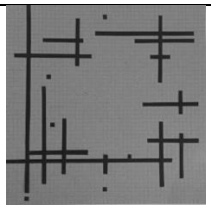
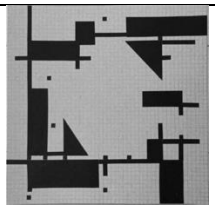
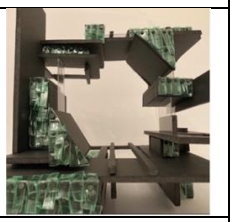
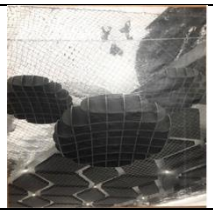
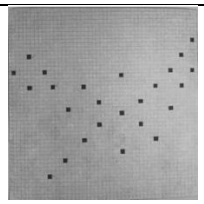
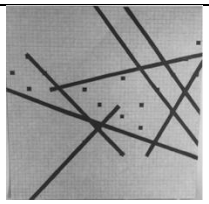
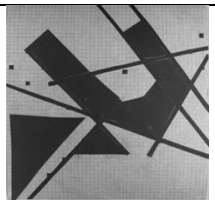
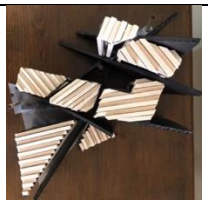
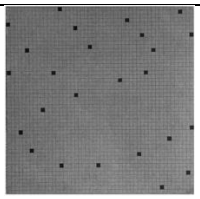
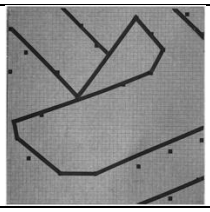
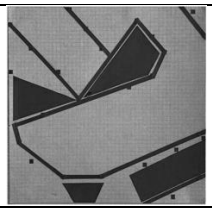
The Studio Process

The analyzes made by the students using the design elements and the student process studies resulting from these analyzes are included in Table 3.

Table 3: *Student works*

	Photo	**Analysis with Point**	**Analysis with Line**	**Analysis with Plane**	**Spatial Volume**
1					
2					
3					

4					
5					
6					
7					
8					
9					
10					

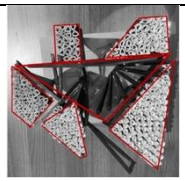
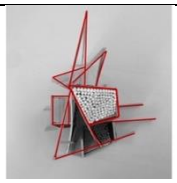
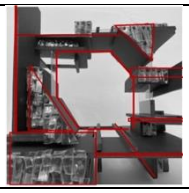
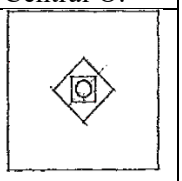
11					
12					
13					
14					
15					
16					
17					

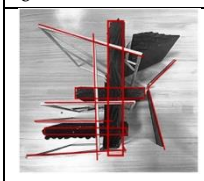
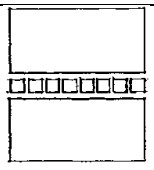
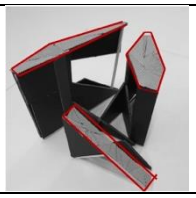
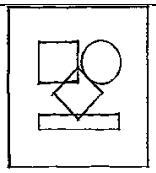
Accordingly, the way in which the form relations in the photo frames are interpreted by making use of the design elements is expressed in the Table 3. In the problem process that started with taking photographs with a defined focal point, the composition, form language and relationships that make up this focal point have redefined with design elements such as point, line and surface. In the ongoing stages of the study, this form language has been expressed in three dimensions The resulting products express the process of analyzing the different formal relationships in the students' photographs and the spatial volumes they create as a result of this process.

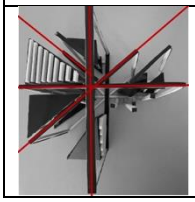
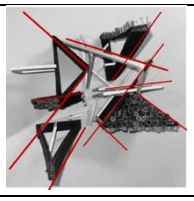
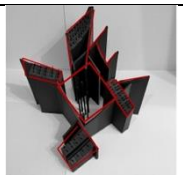
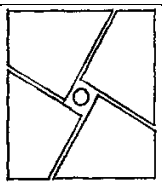
In the analysis process, which started with the point from the design elements, the focal point and the elements in the composition were expressed with the squares represented as points. In the second stage, the composition is improved by including the line from the design elements, provided that the position of the points is maintained. Then, surface values have added to the composition formed by points and lines, provided that the position of the points and lines was preserved. In this process, the relationships that form analyzes and composition have been expressed with fullness in some studies and emptiness in some studies. Since the work was carried out on a gridal background, circular values or elements were expressed as angular.

In this process, formal organization approaches have shaped as central, linear, radial or clustered (Table 4). This diversity was created by the photographs taken at the beginning and the way the students interpreted the relationships in these photographs. Accordingly, Table 4-1, 4-2, 4-3, 4-4, 4-5 refer to the central organization, while Table 4-10, 4-11, 4-12 refer to the radial organization, Table 4-6, 4-7 refer to the linear organization, and finally Table 4-8, 4-9 refers to the clustered organization.

Table 4: *Spatial organization approaches*

1	2	3	4	5	Central O.
					

6	7	Linear O.	8	9	Clustered O.
					

10	11	12	Radial O.
			

Discussion and Conclusion

This study, which is based on the student studies put forward during the studio work that lasts for a semester, includes the examination of the ways in which students benefit from design elements while analyzing two-dimensional relationships and the three-dimensional spatial organization approaches that emerge at the end of this process. In this direction, data and student tendencies for the process of creating a space organization through design elements were revealed. The findings created through student studies exemplify how the form relations in the photographic frames, which are considered as a starting point through design elements, can be analyzed step by step by making use of design elements and the way a spatial organization emerges as a result.

In the three-dimensional spaces created with this study, which was created to be an example of the way of benefiting from design elements in the process of form analysis and space fiction, tendencies towards central, linear, radial and clustered organization are seen. With the study, the way of benefiting from design elements and spatial organization approaches in the transformation process experienced when moving from two dimensions to the third dimension were examined.

In this context with the designed course was intended to ensure that students comprehended different domains, including perception, analysis, combination (synthesis), and assessment during the first-year design studio design process. It was considered that the foregoing analysis-synthesis processes for spatial organization relations during the first year of spatial design education would contribute to students in terms of spatial relations, organizational relations, and the expression of two-dimensional spatial relations in the third dimensional settings. On the other hand, the study is a basic exercise in recognizing and benefiting from design elements and defining a composition and its constituent elements in the third dimension. In the simplest terms, it reveals the form analysis by making use of design elements and the transformation process of this analysis into space organization with its stages.

The study presents a different perspective by contributing to the relevant subject and providing diversity in the literature on spatial organization with the data it reveals about the way design elements are used in the space fiction. The steps revealed by this transformation study, which covers one semester, constitute the results of the study as well as the data. This result is thought to be a contribute in terms of providing methods or perspectives for both design elements and spatial organization approaches in design studios.

Acknowledgment: I would like to thank Design Studio I students for their participation and enthusiasm in this study
Conflict of Interest: The author stated that there are no conflicts of interest regarding the publication of article.
Ethics Committee Approval: N/A
Author Contributions: The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.
Financial Disclosure: The author declared that this study has received no financial support.

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