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Research Article

Creative Design in Action: Exploring Basic Design Principles and Self-Assessment through Workshop Practice

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Abstract

The Basic Design course is a fundamental foundation in design education that introduces students to basic visual principles and creative problem-solving approaches. However, it creates challenges for students transitioning from traditional, rote-based learning environments to more abstract and conceptual thinking. The current study investigated how students comprehend and apply basic design principles through a workshop in the Basic Design I course at the European University of Lefke. The workshop, involving 81 first-year students from four design departments (Architecture, Interior Architecture and Environmental Design – Landscape Architecture – Visual Communication Design) and employed wire art as an applied vehicle for visualising and comprehending theoretical knowledge. The students underwent practical and reflective segments, allowing them to attain in-depth knowledge of design principles like balance, contrast, rhythm, symmetry, proximity, and unity. A guided survey was conducted after the workshop to identify student perceptions of these principles based on demographic factors like age, gender, and academic department. The results showed statistically significant perceptual differences depending on department, with the Visual Communication students especially having a more nuanced consciousness of visual principles. Age also showed significance, especially for the principle of proximity, as a sign of developmental or experiential processes in perception. Moreover, gender differences were found, and male and female students varied in sensitivity to the principles of contrast and symmetry. These findings support the need for integrating physical, three-dimensional workshops within foundation design education. They also highlight the diverse ways students of different backgrounds and disciplines learn about design. Future research must more comprehensively explore how spatial and material experience influences cognitive and creative growth within design learning spaces.

Keywords:
Basic design education, Creativity, Design principles, Self-Assessment, Interdisciplinary design

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INTRODUCTION

The basic design course is the backbone of design departments but the designer candidates have great difficulty in understanding it. The basic design course, a specific and fundamental course for all disciplines related to design, is provided for students as a mandatory course in the first semester of their 1st year. It encompasses many departments such as architecture, interior design, graphic design, and industrial design in the faculties of architecture and fine arts (Sarıoğlu Erdoğdu, 2016). Although there are differences of scale and product between disciplines, basic design comprises the foundation for all of them.

While the course generally targets students gaining problem-solving abilities, from one perspective, this process focuses on teaching abstract and conceptual thinking. In this context, the basic design course plays an important role in the development of creativity (Aşkın, 2018, p.1) and develops students' imaginations. In this course teaching two- and three-dimensional abstract representative methods, generally gestalt design principles adapted from the perception psychology of the Bauhaus school are practiced (Sarıoğlu Erdoğdu, 2016).

In the basic design course, where design principles are taught theoretically and reinforced by practice, the design process is very important. In this process, designer candidates who have completed high school education find themselves within a new system. Contrary to the current rote-learning system, the course-producing work based on visual expression and targeting abstract and conceptual thinking and learning is a very difficult process for designer candidates. The first step in design education is to deal with the design process as a problem-solving action. It is possible to conceptually analyze real and given problems, bring them from the concrete to the abstract plane, produce ideas, and then convert them back to reality with basic design (Sarıoğlu Erdoğdu, 2016).

Within the scope of the course, students are required to learn the concepts of repetition, harmony, contrast, concept, unity, balance, equality, and emphasis among basic design principles; gestalt rules (visual perception rules) of proximity, similarity, continuity, integrity and symmetry; and concepts of point, line, orientation, form, scale, value, color and texture (Gürer & Güler, 2004) among basic design elements. The aim is to ensure the development of creativity among students and to teach methods to produce new and original solutions. Thus, the design process is developed through creativity and current modes of thinking may change (Denel, 1979; Bayraktar et.al., 2012). Recently basic design workshops are shaped by focusing on design principles and concepts and different practices have been notable in basic design courses (Erbay et.al., 2018). In this context, various practices like workshops and group projects are implemented in this course.

Moving from this point, in this study, within the scope of the 'Basic Design I' course, what students learned was tested with the workshop implemented at the end of the theoretical knowledge period. The aim of this workshop study is to question the effects of variables like age, sex,

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and department on the student's perceptions regarding design principles. In this context, the study proposed the following hypotheses:

1. There are significant differences between the perceptions towards the design principles of students from the visual communication department and students from other departments.

2. There are significant differences between the perceptions towards the design principles of students from the architecture department and students from the interior design department.

3.. There are significant differences between the perceptions towards the design elements like negative/positive space and proximity and other design elements among students.

4. There are significant differences between perceptions towards the design elements according to age.

5. There are significant differences in perceptions towards the design elements like contrast and symmetry between male and female students.

The structure of the article consists of a short introduction, defining the relevance of the study; literature review, examining the related research about the topic; methodology section, describing the methods used in the study; results and discussion part, indicating the results obtained from the survey and the conclusion, which summaries general results and outlines future research. Additionally, this study emphasizes the importance of self-assessment in basic design education, encouraging students to become active participants in evaluating their own learning and creative processes.

LITERATURE REVIEW

The Basic Design course is offered in many different disciplines where design education is provided. It is offered in the first half of the semester in schools offering design education, under different names like 'Basic Design', 'Visual Design', 'Foundation Courses' or 'Enseignement Pre´liminaire' and applied design, the course encourages creative and abstract thinking through collaborative and individual work in a studio environment. The pedagogy of the classical schools of design and architecture is also touched up on in this course (Boucharenc, 2006).

Despite the differences in name, the main purpose of the course is to teach the basic design elements and principles of visual design, including line, shape, space, value, texture, volume and color. Focusing mainly on Gestalt, perceptual theory is mentioned, and in the final section it is applied to various projects based on the basic design principles.

At this point, the basic course content of the American, Turkish and Cypriot schools whose syllabuses were obtained were examined and general conclusions were drawn. At this stage, the course contents of Tohono O'odham Community College, University of Texas at El Paso from America, Hacettepe University, Karadeniz Technical University, Osman Gazi University, Middle East Technical University and ITU Faculty of Architecture from Turkey, Lefke European University, Eastern Mediterranean University and Girne American University from the

Turkish Republic of Northern Cyprus were accessed and conclusions were drawn through examples (Chappel, 2024; Foerster, 2024).

As far as the course is concerned, in Turkey, basic design was first included as a course in the programme of the Istanbul Tatbiki Fine Arts Academy in 1957. (The name of the course in the programme is Basic Art Education) (Kaya, 2018). In the early period of the course's provision, its curriculum was analogous in Turkey and worldwide, with two-dimensional applications and the theoretical infrastructure generally supporting many design schools' basic design courses. In recent years, however, three-dimensional applications have assumed greater importance, and the number of two-dimensional applications has been reduced (Araz et al., 2015).

The course's experiential and hands-on approach, emphasizing practical learning, was identified as a pivotal element in facilitating student learning, fostering creativity, and challenging preconceived notions (Özkar & Steino, 2012; Erkan, 2006). In addition, studies have demonstrated that collaborative work in a shared environment significantly impacts the course, with social interaction contributing to learning outcomes (Krejins et al., 2004).

The following are the results of the curriculum analysis. The course curriculum includes the following topics:

- Elements of design: point, line, direction, size, shape, value, texture, color.
- Visual perception: figure-ground relationship, organization principles, proximity relationship, similarity, shape properties.
- Principles of design: balance, concept, contrast, harmony, hegemony, repetition, unity.
- Space, form and geometry: two and three-dimensional concepts (Akbulut, 2010).

Depending on the course content, the course process is enhanced through workshops in different schools, which facilitate the integration of theoretical and visual knowledge with real-life applications and the contribution of production to the perception of design. One such workshop was conducted within the METU Architecture and Planning department. The METU Architecture department offers Basic Design courses with a more concrete (environment) focus during certain periods (Özer, 1966; Özgüner, 1966; Erdoğdu, 2016).

An additional example was implemented at Bursa Orhangazi University. The students participating in this course were able to apply their theoretical knowledge to real-world scenarios by engaging in practical workshops utilizing clay and sand, which took place in an open-air setting. In the ITU Architecture Department, a sand study was conducted on the beach between 2007 and 2008 (Dursun et al., 2009; Şenel, A., & Onur Sönmez, N., 2014). The objective of this workshop was to facilitate the learning of natural materials and the execution of design exercises with them (Şenel, A., & Onur Sönmez, N., 2014). At Karadeniz Technical University, the workshops were conducted at different periods

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with the aim of investigating the question of whether there were any parallelism between the acquisition of basic design course and the design process (Ustaömeroğlu et al., 2015). One of the other workshops was applied to test whether the participants could use the course acquisitions on a concrete object or which acquisitions they would use more. The objective of this particular workshop was to explore the transformation of fundamental design principles into the realm of product and interior furniture design (Erbay et.al. 2018). In another workshop, students were instructed in the use of materials and colors to design an original composition. This study was conducted at Konya University in the fall semester of 2022-2023. The culmination of this educational endeavor entailed the practical application of the abstract concepts acquired throughout the academic year, manifesting in the creation of a composition that seamlessly integrated functionality and aesthetic appeal. (Azkur &Oral, 2023).

The structure of design education is to be founded upon compulsory theoretical and studio courses. The integration of unique activities, such as informal short-term studies and diverse group organizations, into the formal curriculum is posited as a means of engendering a more creative atmosphere for students (Kahvecioglu, 2007).

In addition to fostering an environment conducive to creativity for the students, a key characteristic of these workshops is the process of transferring the abstract knowledge acquired from the course to tangible designs. This transfer process, in turn, is integrated into the design applications on concrete objects. Concurrently, it is regarded as the inaugural step in acquiring the pertinent material. In these studies, a variety of teaching techniques are employed in the design course process and workshop studies.

A review of the extant literature reveals three distinct approaches: the short-term training method, learning by doing, and the action research method.

Short- Term training method; The definition of the workshop as an educational tool may be expressed as follows: "An educational meeting where a small group explores a subject, develops a skill or technique, or carries out a creative project, etc." Workshops represent a significant informal learning environment, offering an effective short-term training method that can be utilized in a diverse range of settings across a wide array of topics. (Brooks-Harris & Stock-Ward, 1999).

The learning by doing method is defined as a pedagogical approach that encompasses experiential learning activities and experiences for students, encouraging them to engage with and apply their knowledge in real-world contexts (Erbil, 2008). This approach is also holistic in nature, engaging students in all stages of the creative process and preparing them to effect change on a global scale through innovative design and forward-thinking (Learning by Doing: How Student Projects Give Architects and Designers Room to Grow, 2020). It is evident that the aforementioned educational environment facilitates experiential learning in the domains

of building area, structure, material and material handling (Şahin, 2013). Consequently, product construction constitutes a pivotal component in comprehending the design process. Consequently, construction is an integral element of the design process. The learning by doing method encompasses the following subjects: Thinking and doing, cooperation (teamwork, unity of purpose, awareness of responsibility), service to the community and communication skills (Şahin, 2013; Güzelçoban Mayuk & Coşgun, 2020).

Action research (AR) can be defined as a novel methodology for the systematic organization of teaching practice in emergent contexts. Currently, AR has been employed in several areas of higher education, especially to comprehend a phenomenon in depth that has no documented experiences. This methodology has been employed in various fields, including the comprehension of architectural concepts such as sustainability and architectural design (Kowaltowski et al., 2019), the development of collaborative research for the study of architectural design (Caldwell et al., 2016), and the utilization of virtual reality for spatial design in architecture (Nisha, 2019). In conclusion, action research can be defined as a method for understanding teaching as a research method through experience, reflection, and practice (Bausela Herreras, 2004; Morales, 2022).

Following a comprehensive review of the extant literature, it can be concluded that the overarching structure of the workshop study was formulated through the integration of the initial two methodologies within the purview of the study. The Short-Term Training method, which involves the execution of the study in small groups in an informal environment for a short-term period, and the Learning by Doing method, were amalgamated in the study, thereby giving rise to the method of the workshop study.

DESIGN AND CREATIVE DESIGN APPROACH

Emergence of the Basic Design Concept

Basic Design creates the required base for any professional design training and various departments like Graphic Design, Industrial Design, and Interior Design offer it as a common course (Kocadere & Özgen, 2012). The idea of the requirement for a foundation course for professional design training was proposed by the founders of the influential and famous design school Bauhaus in 1919 (Westphal, 1991).

''Bauhaus'', founded in Germany in 1919 by Walter Gropius was the first design education school. Gropius' Bauhaus aimed at creating handcrafts that combined architecture, sculpture, and pictures (Beşgen et all., 2015). Its main goal was to reinvent the tangible world in order to express the unification of all the arts, which was a novel concept (Griffith Winton, 2000; Beyaz & Erçin, 2023). The Nazi regime abolished the Bauhaus School in 1933, so many of the scholars continued to apply the Bauhaus philosophy in various countries (Lloyd Jones, 1969).

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Bauhaus aimed at integrating art through design into everyday life and combined fine arts and applied arts by removing the boundaries in between them (Feierabend & Fiedler, 2000). The conventional basic design instruction is arranged towards teaching visual composition through elements and principles (Kaya, 2018). The major aim of the basic design education course was to guide the students to integrate components like line, color, point in a coherent manner through fundamental design principles like contrast, emphasis, harmony, repetition, and balance (Thiel, 1981; Wong, 1993; Wender & Roger, 1995).

The basic design course is very crucial among the other design courses due to the fact that the freshmen design students first learn about the design phenomena in these courses (Denel, 1998, Abbasoğlu Ermiyagil & Urfalı Doğu, 2019). Saranlı (1998), Sausmarez (1983) and Teymur (1998) define the design education process by indicating that it gives way to various solutions through distinct points of views by encouraging originality in interpretation and expression. Studio environments are prepared for design courses where the students actively take part and are evaluated in everyday life projects. Instead of imitating 19th century old styles, the design courses deal with research that are entirely abstract and with studies that are not based on a specific function, (Sözen & Tanyeli, 1992). Currently, many basic design instructions inhibit and continue with this tradition and approach. Students are encouraged to make creative designs through the basic design courses and these abilities are supported with workshops.

Innovation Concept/ Creative Design Approach

According to the American Heritage Dictionary (2000), the term ''innovation'' originally comes from 'novus' which is a Latin word meaning 'new'. The word then turned into the verb 'in+novare' covering the meaning 'to make new'. Thus, basically 'to innovate' has the meaning of 'to begin or introduce (something new) for the first time' and resulted in having the meaning of 'the act of introducing something new'. Leonard and Swap (1999) define 'creativity' as ''... a process of developing and expressing novel ideas that are likely to be useful'', therefore, highlighting that innovation is the conclusion of a creative activity (Mutlu & Er, 2003).

Being creative and original has always been the nature of basic design. Every designer candidate learns the idea of being creative during the design process in workshops. At this point, it is necessary for the student to accurately experience the design process. Participation during the course should be interactive, involving the exchange of ideas with the lecturers. Conversion of theoretical knowledge to abstract design is experienced in the studio environment during the design process and creativity plays an important role in this sense. The originality of the design idea of a product is closely linked to success.

Process of Basic Design Courses

Within the scope of the Basic Design I course, students are initially taught the theory of design elements and principles. Later, students perform 2-dimensional abstract studies using the presented design elements and principles (Table 1, Table 2, Table 3, Table 4). The course mainly continues in this way until the first half of the semester.

Table 1. Two Dimensional Works demonstrating Figure-Ground Relationship (Source: Authors).

Table 2. Two Dimensional Works demonstrating Harmony & Contrast (Source: Authors).

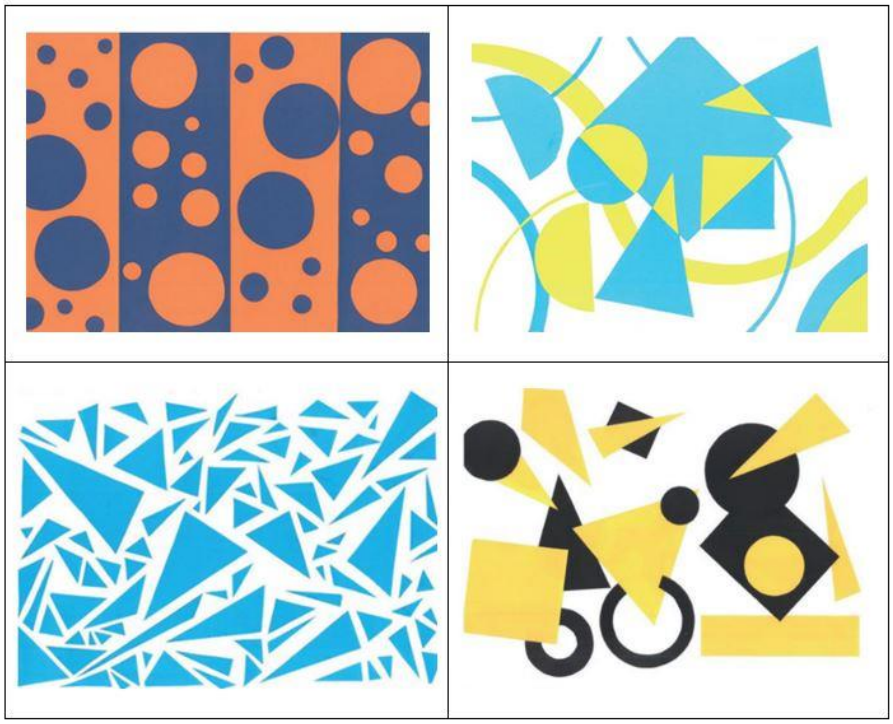

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Table 3. Two Dimensional Works demonstrating Rhythm & Repetition (Source: Authors).

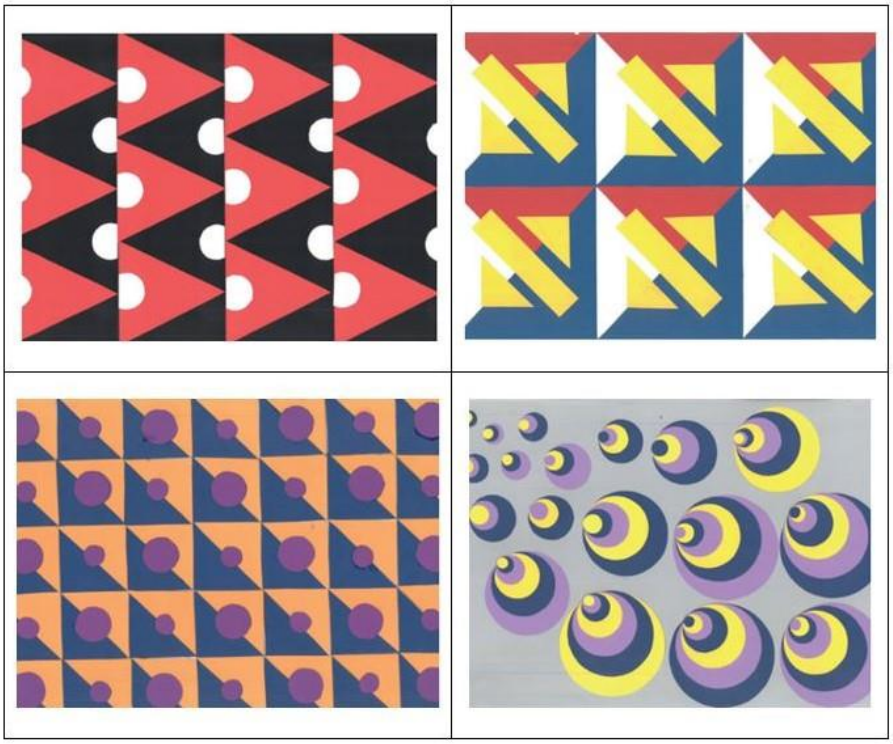
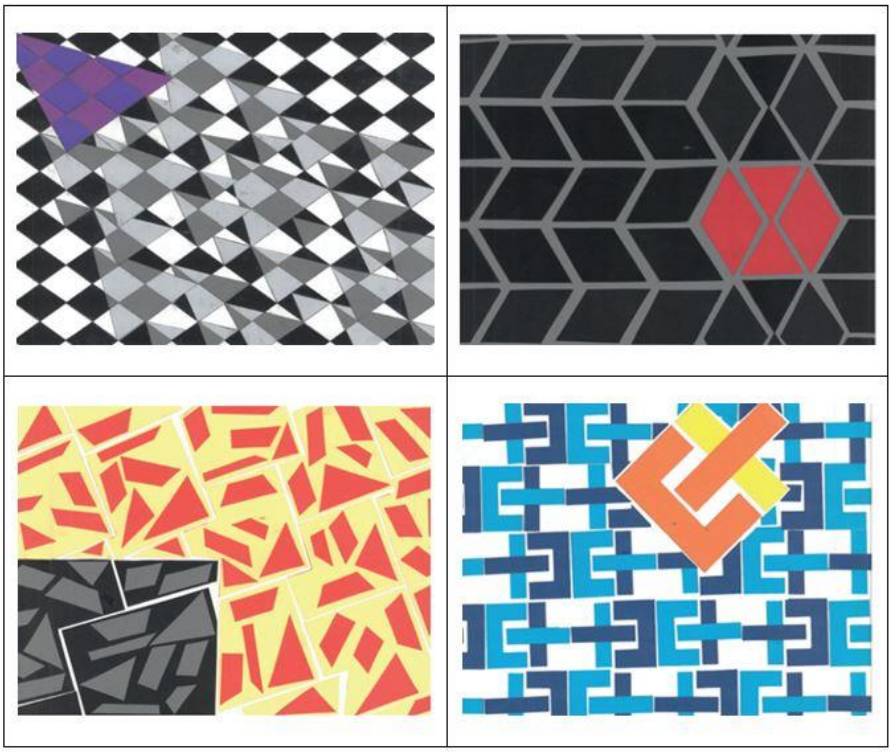


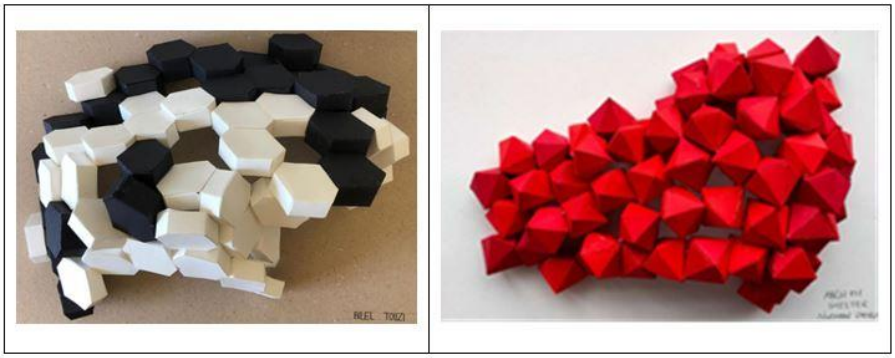
Table 4. Two Dimensional Works demonstrating Emphasis & Unity & Balance (Source: Authors).



After covering two-dimensional studies, the course continues with 3-dimensional studies. Visualization of the theoretical knowledge acquired in 3 dimensions assists students to better understand these principles. In this context, space studies are performed with the acquired knowledge accumulation. The aim is to revive the basic design principles in an

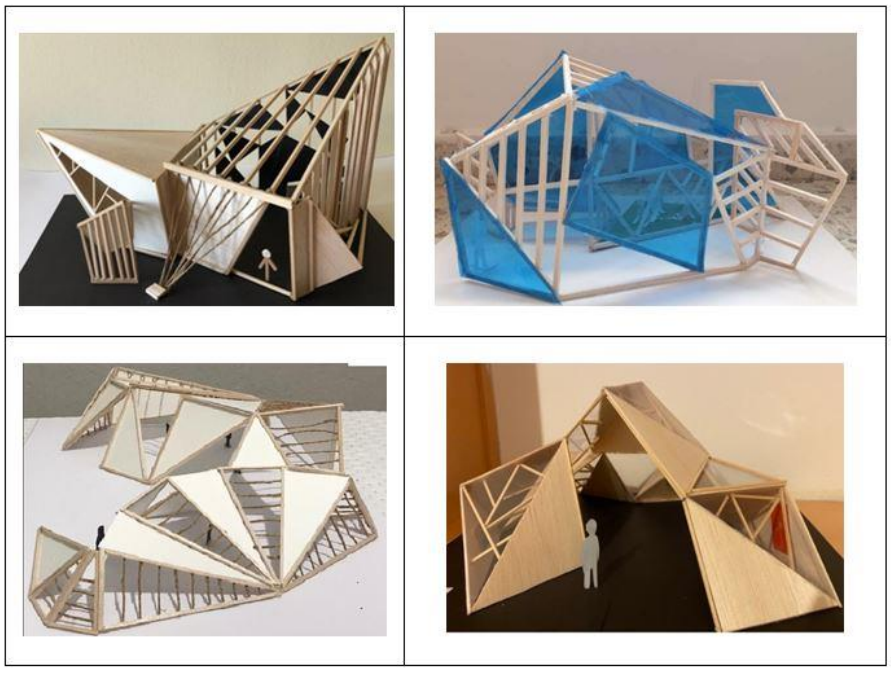
abstract way in space. With this aim, the students complete abstract studies related to daily life depending on the concept of space. Immediately after this, the space concept is supported with the topic of shelter. In the current study, students were requested to create their own original forms and multiply these for shelter designs. With the condition of designing abstract units. Students experience the case of space for the first time by designing a single unit shelter. Table 5 demonstrates some of the student works about shelter, produced in the Arch 151 course during the 2021-2022 fall semester.

Table 5. Students' Shelter Works (Source: Authors).



In the next stage, the course continues with the topic of creating architectural spaces. In this project, students experience the topic of architectural space using different units and various materials. Table 6 below shows some student works regarding the architectural space topic created during the 2021-2022 fall semester. With this study, the load-bearing system for space was also conceptualized. The abstract studies continue to be supported by workshops.

Table 6. Architectural Space Works (Source: Authors).



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Many workshops on space are offered during the design week which is traditionally held every year by our faculty. This ensures that the students strengthen their knowledge. In these workshops, students are asked to produce 1:1 scale space studies (Table 7). The students experience designing shelters with realistic scales of the space and thus, raise awareness.

Table 7. 1/1 Scale Architectural Space Works (Source: Authors).


METHODOLOGY

In relation to the literature review, there are numerous advantages to learning by doing and short-term training methods. The rationale behind the selection of these methodologies was to enhance students' creativity, facilitate knowledge exchange, and promote collaborative learning and experiential learning in the design and production processes. Consequently, it was determined to develop a workshop study that would be conducted in a manner independent from the course studies. The study's structure was devised by integrating these methodologies. The primary rationale for incorporating the workshop study into the course framework was to facilitate the transformation of abstract designs into concrete applications, drawing upon the experiential knowledge of the course instructors. To this end, the concept of eliminating deficiencies was elucidated through an examination regarding the aims and outcomes of the applied workshops.

In the context of this study, a questionnaire was administered to students enrolled in the 2020–2021 fall semester basic design studio course. The utilization of a structured survey was driven by its capacity to expedite data collection and reach a substantial audience. The survey was disseminated to first-year undergraduate architecture students enrolled in basic design course during the current semester. The survey was administered to undergraduate students enrolled in the European University of Lefke's Faculty of Architecture and Design, specifically from four distinct departments: 24 architecture, 11 interior design, 14 graphic design and 5 visual communication. A total of 81 students participated in the survey, which was divided into two sections.

In the first part, students' demographic data, including gender, age, and department, was collected. The second section of the survey related to the perceptual evaluation of student projects by their peers. The evaluation of all projects was conducted by the students who attended

the workshop. The Likert scale, a method of data collection that employs a five-point rating system, was utilized to assess each project. The indicators presented in the questionnaire are based on the degree of visual perception, which in turn is represented by proportion, repetition, rhythm, harmony, contrast, emphasis, balance, unity, negative/positive, proximity, similarity, continuity, symmetry, and enclosure.

Workshops are important tools in the basic design courses to give a clearer understading for the students to increase visual perception and creativity. It is known that theoretical knowledge is more easily perceived through products emerging from workshop studies. In this context, the theoretical knowledge taught during the basic design course in the Faculty of Architecture and Design at the European University of Lefke is interrogated with these workshops. The study included students from four different disciplines, interior design, architecture, graphic design and visual communication, departments. The interdisciplinary workshops, with the participation of students from four different disciplines, involve the original aspect of the research.

The workshop also encouraged both peer and self-assessment to strengthen reflective learning. Following the completion of the practical phase, each student was asked to evaluate their own creative process in terms of how effectively they applied the design principles. This reflective component aimed to foster metacognitive awareness, self-regulation, and a deeper understanding of visual perception in line with the perspectives of Braund & DeLuca (2018) and Wanner & Palmer (2018). As emphasized by Masatlıoğlu and Balaban (2024), "reflective thinking and self-assessment processes play a crucial role in fostering students' awareness of their own design decisions and creative growth within the architectural studio environment." In accordance with this understanding, the reflective self-assessment stage was completed through guided prompts such as: "Which design principles did I use effectively?", "What visual relationships were hardest to express in 3D form?", and "How can I improve my next design study?" Students' responses were documented qualitatively and compared with peer evaluations to identify overlaps and divergences in perception. The general structure of the study can be seen in the flowchart below (Figure 1).

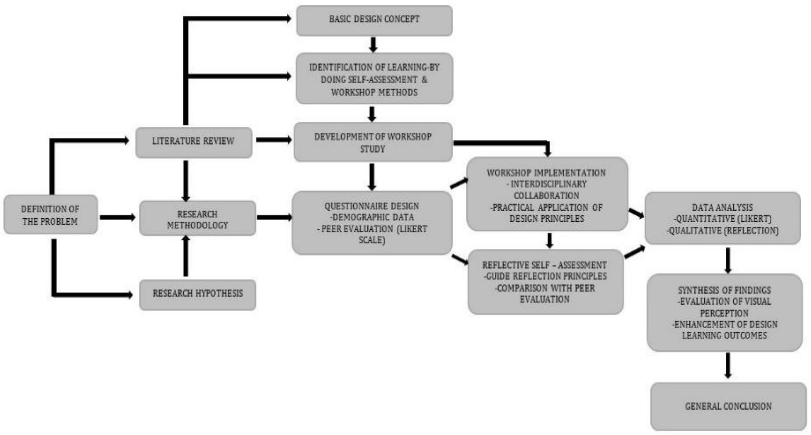

Figure 1. Flowchart of the methodology (created by authors). (created by authors).

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Definition and Method of Workshop Studies

Workshops are included in the basic design courses for the students to better understand the current system and to increase visual perceptions and creativity. It is known that theoretical knowledge is more easily perceived through products emerging from workshop studies. In this context, the theoretical knowledge taught during the basic design course in the faculty of architecture and design at the European University of Lefke is interrogated with these workshops. The study included students from four different disciplines, architecture, interior design, visual communication, and graphic design departments. The interdisciplinary workshops, with the participation of students from four different disciplines, comprise the original aspect of the research.

The workshop considered artistry in the present day and wire art as a tool to visualize theoretical knowledge. Wire art is a form of art, with a history dating back thousands of years, based on obtaining several products using different types of metal wires like iron, aluminium, and copper. In this workshop, students developed working skills with wires using basic design principles and simple tools like pliers and wire cutters.

This workshop was carried out in three phases (Figure 2):

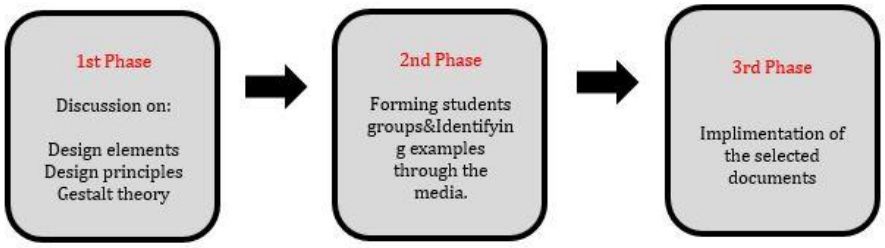


Figure 2. Phases of The Workshop (created by authors).

First stage: Discussions were carried out about different examples, repeating the conceptual framework and knowledge explained within the scope of the basic design course. In this context, basic design elements like point, line, scale, orientation, interval, color, and texture; basic design principles like repetition, harmony, rhythm, contrast, emphasis, balance, and unity; and gestalt perception concepts (Lang et al., 1974; Lang, 1987; Gürer, 1990; Güngör, 2005; Gökaydın, 2010) like shape-floor, proximity, similarity, and enclosure were summarized and explained in short and supported with examples (Erbay et al., 2018).

Second stage: After repeating the conceptual framework and knowledge, students were requested to form groups within their own disciplines and to research their own examples through media. Within the scope of the course, the 81 students from 4 different disciplines were grouped within their own disciplines. A variety of examples reflecting architecture, interior design, graphic communication, and visual communication departments in media, were identified together with the lecturers. The selection of contemporary art examples was made with great care, with the aim of identifying works that demonstrate an abstract interpretation of fundamental design principles. These principles, which underpin all forms of design, encompass aspects such as balance,

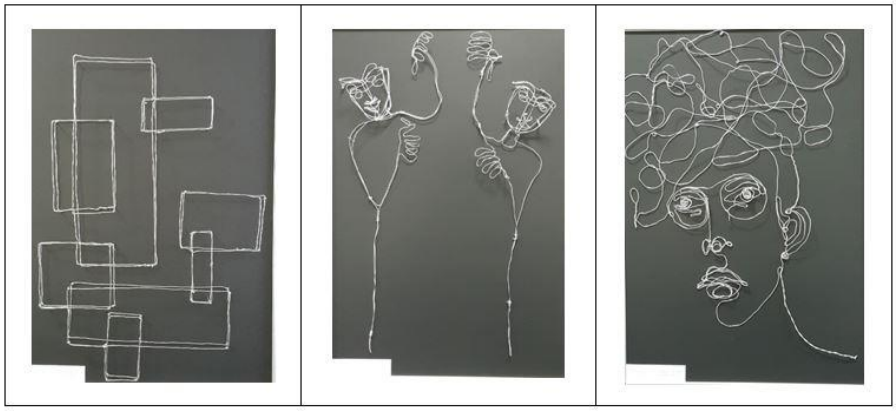
composition, visual aesthetics and the way in which a design engages with its audience. (Galchynska et al., 2023).

Third stage: This stage was the implementation stage. Each group was given pliers, wire, and 70 x 100 scale foam cardboard as working tools. Later, the chosen example studies were applied to the foam cardboard using wire elements. At the end of the workshop, a total of 15 different wire projects were produced (Table 8 shows 3 examples of these projects).

Data obtained at the end of the workshop were entered into the SPSS program for analysis. In accordance with the aim of the research, the accuracy of the hypotheses was interrogated.

In this context, the research scope included a total of 54 students who attended the course and the projects they produced. A survey was conducted with these students about how they perceived the theoretical knowledge and the degree to which they perceived this knowledge (basic design principles and gestalt perception principles) taught within the scope of the basic design course. At the end of the questionnaire, the data obtained were discussed within the scope of the study.

Table 8. Some Workshop Examples (Source: Authors).



RESULTS AND DISCUSSION

In this part, firstly demographic data is provided. Demographic data like gender, age, and the department of the students was collected through the questionnaire. Undergraduate students from the European University of Lefke, in Lefke, were selected from The Faculty of Architecture and Design from 4 different departments (24 architecture, 11 interior design, 14 graphic design and 5 visual communication first year students pursuing their bachelor degrees). The demographic data of the groups were similar regarding gender containing 53,7% males and 46,3% females. 44,4 % architecture students, 20,4% interior design students, 25,9% graphic design students, and 9,3% from the visual communication department. The students ages varied between 18 to 26 years. The age groups consisted of 18 to 20 years and this made up 57,4% of the groups, another group consisted of 21 to 23 year olds and this made up 31,5% of the students, and finally the remaining 11,1% of the students were 24 to 26 year olds (Table 9).

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Table 9. Demographic Information (created by authors).

Demographic Information		
Gender	Number	Percent
Female	25.0	46.3
Male	29.0	59.7
Department	Number	Percent
Architecture	24	44.4
Interior Architecture	11	20.4
Graphic Design	14	25.9
Visual Communication	5	9.3
Age	Number	Percent
18-20	31	57.4
21-23	17	31.5
24-26	6	11.1
27-29	0	0
30-32	0	0
Total	54	100

The second part is a perceptual evaluation of the students about student projects. All the projects were evaluated by the students who attended the workshop. The second part includes the perceptual evaluation of all the projects by all the students who attended the workshop. Table 10 demonstrates the distribution of the scores through the 5-point Likert scale. Indicators are presented in the tables in the findings section and the scales depend on the degree of visual perception (representing proportion, repetition, rhythm. harmony, contrast, emphasis, balance, unity, negative/positive, proximity, similarity, continuity, symmetry, enclosure).

Table 10. Likert Scale Description (created by authors).

Likert Scale Description	Likert Scale
Strongly Disagree	1
Disagree	2
Neutral/Uncertain	3
Agree	4
Strongly Agree	5

In the evaluation section, design principles were accepted as "dependent variables" and gender, departments and age were accepted as "independent" variables. There are different reliability tests but the Cronbach alpha, which is the most widely used nowadays, was applied in this study. The reliability test for responses to the questionnaire obtained with the Cronbach's alpha method is shown in Table 11. This test is also suitable for use with Likert-type scales. According to the Cronbach alpha test in Table 3, the reliability value for the semantic differential scale average of eight design principles and 54 questions was 0.964. Cronbach (1951), and Panayides (2013) stated that the alpha reliability coefficients for all items can be accepted as "reliable" when they are above 0.70. The test results show that Cronbach's alpha is above the threshold of 0.7 recommended by Hair et al., (1998), Cronbach (1951), and Panayides (2013) as reliability statistics indicate that the overall level is .964 meaning that the measurement items in this study are reliable (Alotaibi,

2023). The Cronbach alpha coefficient in this study was above this value and this indicates the semantic differential scale was reliable.

Table 11. Table Dependent Variable Reliability Test Results (created by authors).

Reliability Statistics	
Cronbach's Alpha	N of Items
.964	143

Within the scope of the research, the t-test analysis was used to reveal the differences in the perception of design principles (dependent variables) according to the independent variable of gender. The results of the analysis found statistically significant differences between males and females for the design principles of repetition, contrast, and symmetry (Table 12).

Table 12. Test Results for Difference in Gender (created by authors).

Test Results for Difference in Gender										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
Dependent Variables		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Proportion	Equal variances assumed	1.944	0.169	-0.873	52	0.387	-1.876	2.150	-6.189	2.437
	Equal variances not assumed			-0.860	46.391	0.394	-1.876	2.182	-6.267	2.516
Repetition	Equal variances assumed	0.016	0.899	-2.251	52	**0.029**	-4.997	2.220	-9.452	-0.542
	Equal variances not assumed			-2.258	51.388	0.028	-4.997	2.213	-9.440	-0.555
Rhythm	Equal variances assumed	0.000	0.989	-1.403	52	0.167	-3.495	2.491	-8.494	1.503
	Equal variances not assumed			-1.417	51.985	0.162	-3.495	2.466	-8.444	1.453
Harmony	Equal variances assumed	0.674	0.416	-0.636	52	0.528	-1.072	1.686	-4.456	2.312
	Equal variances not assumed			-0.642	51.966	0.524	-1.072	1.671	-4.424	2.281
Contrast	Equal variances assumed	1.332	0.254	-3.360	52	**0.001**	-7.172	2.135	-11.456	-2.888
	Equal variances not assumed			-3.308	46.210	0.002	-7.172	2.168	-11.537	-2.808
Emphasis	Equal variances assumed	5.681	0.021	-1.292	52	0.202	-3.476	2.690	-8.874	1.922
	Equal variances not assumed			-1.261	42.876	0.214	-3.476	2.755	-9.033	2.081
Balance	Equal variances assumed	2.311	0.135	-1.888	52	0.065	-4.052	2.146	-8.358	0.254
	Equal variances not assumed			-1.854	45.056	0.070	-4.052	2.186	-8.455	0.351
Unity	Equal variances assumed	0.020	0.887	-0.375	52	0.709	-0.709	1.891	-4.503	3.085
	Equal variances not assumed			-0.371	47.848	0.712	-0.709	1.911	-4.553	3.135
Negative/ Positive	Equal variances assumed	0.076	0.784	0.833	52	0.409	2.446	2.935	-3.445	8.336
	Equal variances not assumed			0.831	50.178	0.410	2.446	2.944	-3.467	8.358
Proximity	Equal variances assumed	1.112	0.297	-1.285	52	0.205	-3.668	2.855	-9.396	2.061
	Equal variances not assumed			-1.276	49.052	0.208	-3.668	2.875	-9.445	2.110
Similarity	Equal variances assumed	0.564	0.456	-1.082	52	0.284	-2.623	2.424	-7.488	2.241
	Equal variances not assumed			-1.079	50.105	0.286	-2.623	2.432	-7.508	2.261
Continuity	Equal variances assumed	0.950	0.334	-1.221	52	0.227	-2.310	1.892	-6.106	1.486
	Equal variances not assumed			-1.199	45.023	0.237	-2.310	1.927	-6.192	1.571
Symmetry	Equal variances assumed	1.920	0.172	-2.497	52	**0.016**	-6.687	2.677	-12.060	-1.314
	Equal variances not assumed			-2.478	48.826	0.017	-6.687	2.699	-12.111	-1.263
Enclosure	Equal variances assumed	28.707	0.000	-0.455	52	0.651	-1.422	3.123	-7.688	4.844
	Equal variances not assumed			-0.435	34.248	0.666	-1.422	3.266	-8.058	5.214

In the second stage, the effects of the department on the dependent variables were interrogated. As the number of departments was more than two, a one-way analysis of variance (ANOVA) test was applied to analyze the interactions with dependent variables, instead of the t-test. As a result of the analysis, which departments and design principles

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induced significant differences in the theoretical knowledge were questioned. The theoretical knowledge was examined according to each department and also about which design principles indicated significant differences. Within this context, according to Table 13, significant variations in perceptions of negative/positive space, proximity, continuity, and enclosure principles were identified according to different departments.

Table 13. ANOVA Results for Difference regarding Departments (created by authors).

ANOVA Results for Difference regarding DEPARTMENTS						
		Sum of Squares	df	Mean Square	F	Sig.
Proportion	Between Groups	293.683	3	97.894	1.643	0.191
	Within Groups	2979.354	50	59.587		
Repetition	Between Groups	335.263	3	111.754	1.624	0.196
	Within Groups	3441.496	50	68.830		
Rhythm	Between Groups	411.456	3	137.152	1.679	0.183
	Within Groups	4084.470	50	81.689		
Harmony	Between Groups	189.943	3	63.314	1.748	0.169
	Within Groups	1810.890	50	36.218		
Contrast	Between Groups	474.349	3	158.116	2.326	0.086
	Within Groups	3398.466	50	67.969		
Emphasis	Between Groups	284.491	3	94.830	0.962	0.418
	Within Groups	4929.509	50	98.590		
Balance	Between Groups	163.377	3	54.459	0.832	0.482
	Within Groups	3271.882	50	65.438		
Unity	Between Groups	301.668	3	100.556	2.285	0.090
	Within Groups	2200.703	50	44.014		
Negative/Positive	Between Groups	1142.458	3	380.819	3.844	**0.015**
	Within Groups	4953.042	50	99.061		
Proximity	Between Groups	1673.782	3	557.927	6.648	**0.001**
	Within Groups	4196.310	50	83.926		
Similarity	Between Groups	585.452	3	195.151	2.703	0.055
	Within Groups	3609.882	50	72.198		
Continuity	Between Groups	581.846	3	193.949	4.878	**0.005**
	Within Groups	1988.025	50	39.760		
Symmetry	Between Groups	542.881	3	180.960	1.787	0.162
	Within Groups	5062.452	50	101.249		
Enclosure	Between Groups	1463.762	3	487.921	4.542	**0.007**
	Within Groups	5370.997	50	107.420		

In the following stage, the Tukey test was applied with the aim of revealing which departments perceived the principles differently. The perception of the 4 design principles identified with the ANOVA test was analyzed for all departments. Differences between the means in these groups were numerically identified. The star (*) beside these numerical values indicate a significant difference between the two means. When Table 14 is evaluated, negative/positive space, proximity, continuity, and enclosure (dependent variables) were mostly perceived differently by students in the visual communication department compared to students from other departments. The table below shows which department is significantly different from other departments for each construct.

Table 14. Tukey HSD - Multiple Comparisons Table (created by authors).

Tukey HSD - Multiple Comparisons							
Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Negative/Positive	Architecture	Interior Architecture	0.576	3.624	0.999	-9.06	10.21
		Graphic	-0.333	3.347	1.000	-9.23	8.56
		Visual Communication	15,867*	4.893	0.011	2.86	28.87
	Interior Architecture	Architecture	-0.576	3.624	0.999	-10.21	9.06
		Graphic	-0.909	4.010	0.996	-11.57	9.75
		Visual Communication	15,291*	5.368	0.031	1.02	29.56
	Graphic	Architecture	0.333	3.347	1.000	-8.56	9.23
		Interior Architecture	0.909	4.010	0.996	-9.75	11.57
		Visual Communication	16,200*	5.185	0.015	2.42	29.98
	Visual Communication	Architecture	-15,867*	4.893	0.011	-28.87	-2.86
		Interior Architecture	-15,291*	5.368	0.031	-29.56	-1.02
		Graphic	-16,200*	5.185	0.015	-29.98	-2.42
Proximity	Architecture	Interior Architecture	3.273	3.336	0.761	-5.59	12.14
		Graphic	-1.929	3.081	0.923	-10.12	6.26
		Visual Communication	18,400*	4.504	0.001	6.43	30.37
	Interior Architecture	Architecture	-3.273	3.336	0.761	-12.14	5.59
		Graphic	-5.201	3.691	0.500	-15.01	4.61
		Visual Communication	15,127*	4.941	0.018	2.00	28.26
	Graphic	Architecture	1.929	3.081	0.923	-6.26	10.12
		Interior Architecture	5.201	3.691	0.500	-4.61	15.01
		Visual Communication	20,329*	4.773	0.001	7.64	33.01
	Visual Communication	Architecture	-18,400*	4.504	0.001	-30.37	-6.43
		Interior Architecture	-15,127*	4.941	0.018	-28.26	-2.00
		Graphic	-20,329*	4.773	0.001	-33.01	-7.64
Continuity	Architecture	Interior Architecture	-2.549	2.296	0.685	-8.65	3.55
		Graphic	3.673	2.121	0.318	-1.96	9.31
		Visual Communication	8,342*	3.100	0.046	0.10	16.58
	Interior Architecture	Architecture	2.549	2.296	0.685	-3.55	8.65
		Graphic	-1.123	2.541	0.971	-7.88	5.63
		Visual Communication	10,891*	3.401	0.012	1.85	19.93
	Graphic	Architecture	3.673	2.121	0.318	-1.96	9.31
		Interior Architecture	1.123	2.541	0.971	-5.63	7.88
		Visual Communication	12,014*	3.285	0.003	3.28	20.74
	Visual Communication	Architecture	-8,342*	3.100	0.046	-16.58	-0.10
		Interior Architecture	-10,891*	3.401	0.012	-19.93	-1.85
		Graphic	-12,014*	3.285	0.003	-20.74	-3.28
Enclosure	Architecture	Interior Architecture	5.519	3.774	0.467	-4.51	15.55
		Graphic	-3.494	3.485	0.749	-12.76	5.77
		Visual Communication	14,792*	5.095	0.027	1.25	28.33
	Interior Architecture	Architecture	-5.519	3.774	0.467	-15.55	4.51
		Graphic	-9.013	4.176	0.149	-20.11	2.08
		Visual Communication	9.273	5.590	0.356	-5.58	24.13
	Graphic	Architecture	3.494	3.485	0.749	-5.77	12.76
		Interior Architecture	9.013	4.176	0.149	-2.08	20.11
		Visual Communication	18,286*	5.400	0.007	3.94	32.64
	Visual Communication	Architecture	-14,792*	5.095	0.027	-28.33	-1.25
		Interior Architecture	-9.273	5.590	0.356	-24.13	5.58
		Graphic	-18,286*	5.400	0.007	-32.64	-3.94

In Table 14, two-way comparisons were performed between the three different age groups, and numerical differences between the mean values for the groups were provided. As can be seen, there were significant differences in the means of these two-way comparisons. given. In other words, there were significant differences in the means in these two-way comparisons.

Table 15. ANOVA Results for Difference regarding Age (created by authors).

Multiple Comparisons - Tukey HSD							
Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Proximity	18-20	21-23	0.786	2.957	0.962	-6.35	7.92
		24-26	13,737*	4.371	0.008	3.19	24.29
	21-23	18-20	-0.786	2.957	0.962	-7.92	6.35
		24-26	12,951*	4.653	0.020	1.72	24.18
	24-26	18-20	-13,737*	4.371	0.008	-24.29	-3.19
		21-23	-12,951*	4.653	0.020	-24.18	-1.72

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In the next stage, the Tukey test was performed with the aim of determining differences regarding age intervals in terms of perception. Table 15 shows which age group was significantly different from the other age groups regarding proximity.

CONCLUSIONS

The basic design course, which is common in a number of different disciplines, represents a pivotal component within the broader framework of design education. In the context of this study, a workshop was conducted as part of the Basic Design I course, which is offered in the first semester at the Faculty of Architecture and Design at the European University of Lefke. The study utilized visual analysis and survey methods to examine the impact of variables such as age, sex, and department on students' perceptions of design principles. The data obtained were entered into the SPSS programme for analysis. The results obtained in this analysis are reported below and are related to the hypotheses.

- A significant difference was observed between the perceptions of design principles exhibited by students from the visual communication department and those from other departments. In line with the hypothesis, these findings indicate variations in the perception of basic design principles among different academic departments.
- A significant inequality was identified in the perceptions of design elements, such as negative/positive space and proximity, when contrasted with other design elements among the students. Concurrently, substantial disparities were identified between perceptions of design elements such as continuity and enclosure and other design elements among students. The hypothesis was confirmed within the scope of the study.
- Furthermore, significant variations were observed in relation to the age variables, with the proximity design element demonstrating distinct differences in perception when compared to other design elements. The hypothesis that age is an important factor in perception regarding the proximity element was confirmed.
- The study revealed substantial differences in perceptions of design elements, such as contrast and symmetry, between male and female students. Furthermore, notable gender-related variations were identified in the perception of the repetition element.

This study investigated how different design principles are perceived according to variables such as department, age and gender. The study analyzed two-dimensional projects. In conclusion, differences were found in the perception of principles in the visual communication department compared to the other departments. Related to this, the students visually perceived the design elements of negative/positive space, proximity, continuity and enclosure more clearly. In the second stage, age related investigations revealed that the age variable was a factor in the perception of the design element of proximity. In the final stage of analysis, significant differences were identified according to

gender in the contrast and symmetry elements. In relation to these results, it is recommended that future research should target the identification of differences between departments by focusing on three-dimensional studies.

An additional finding derived from the reflective stage of the workshop indicates that self-assessment activities can meaningfully contribute to the development of metacognitive skills in basic design education. By reflecting on their own creative decisions, students became more aware of their perceptual tendencies and problem-solving strategies.

Future research should integrate both quantitative (statistical) and qualitative (self-assessment/reflection) data to offer a more holistic view of how students learn design principles. Such an approach can deepen understanding of the relationship between spatial reasoning, creativity, and self-awareness in foundational design education.

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