Research Article

A contemporary interpretation of abstraction and creativity through Islamic patterns in design education: Interior architecture studio experience

Asst. Prof. Dr. Ali Akçaova[1]* , Asst. Prof. Dr. Mine Sungur[2]

[1]Selçuk University, Faculty of Architecture and Design, Department of Interior Architecture, Konya, Türkiye.
aliakcaova@selcuk.edu.tr

[2]Selçuk University, Faculty of Architecture and Design, Department of Interior Architecture, Konya, Türkiye.
mkarakoyun@selcuk.edu.tr

*Corresponding Author

Abstract

The goal of this study is to develop a studio experience that will allow second-year interior architecture students to incorporate the continuity of traditional Islamic patterns into contemporary designs. Islamic geometric patterns from the Seljuk eras were investigated as part of the study's focus, and these patterns were used as a foundation for the development of a novel design model. It is important for the systematization of the design process that the working methodology is structured in three phases, namely the analytical phase, the creative phase and the application phase. The process of gathering data is part of the analytical phase, but the creative phase is where the data is abstracted and interpreted. As a result, the study has been presented as a unique one in terms of bringing awareness of conventional and regional patterns in interior architecture education as well as sustainability with motivated, abstract, avant-garde, and contemporary approach.

Keywords: Islamic patterns, Creativity, Abstraction, Interior architecture

Extended Abstract

Introduction: The foundations of creative thinking are discovering the potential of cultural and architectural heritage and incorporating it into contemporary life to produce something new and original in problem-solving in design education (El-Zeiny & Ezzat, 2021). One of the original arts that directly influences modern designers design processes is culture, which serves as the main prototype of modern design. For this very reason, cultural influences are like an endless source of inspiration for modern design and its rich soil that cannot be disregarded (He, 2022). Geometric motifs are widely used in architectural elements, even though they were first used in Anatolian culture in Turks during pre-Islamic times and can be found in every age (Sönmeztürk et al., 2022: 49). Ahmed (2022) emphasized that while researchers and study geometric patterns' history, technique, philosophy, and other facets, there haven't been enough studies on how to incorporate them into modern life. However, patterns can be used abstractly in modern structures. Different techniques can be used in the educational process to realize the designers' interpretation model by abstracting traditional patterns.

Purpose and scope: The study's main issue in this context is that interior architecture education does not provide enough groundwork for creative thinking, despite the prevalence of Islamic patterns that reflect our nation's cultural identity in architectural works. The study aims to reveal original, contemporary lines that are not imitated, as well as to foster creative and abstract thinking by incorporating patterns that carry the spirit of Islamic culture and heritage into the interior design studio process. Students of interior architecture from various parts of the nation were asked to observe Seljuk structures in the cities they reside in and conduct research on the Islamic patterns of the structures as part of the study. As a result, the modern design environment is a platform that provides distinctive solutions that holistically integrate the past and

present. The concept of incorporating and developing the said approach in the educational process of various design disciplines should be expanded to increase the number of original and creative designs inspired by the cultural data of societies. Additionally, the study enhances the students' design skills as they learn interior architecture within the context of the design process.

Method: In the study, Selcuk University Faculty of Architecture and Design Interior Architecture Project II studio, within the scope of the 2021-2022 spring semester, the interior design of the store (textile, cosmetics, sports) where the products of world-famous brands are exhibited using Islamic pattern patterns were given to the students as a project subject. It aims to demonstrate various viewpoints on creativity and abstraction in this context. The abstraction action that was mentioned in the study was formal abstraction; functional and semantic abstraction were not included. Islamic geometric patterns from the Seljuk eras were investigated as part of the study's focus, and these patterns were used as a foundation for the development of a novel design model. It is important for the systematization of the design process that the working methodology is structured in three phases, namely the analytical phase, the creative phase and the application phase. The process of gathering data is part of the analytical phase, but the creative phase is where the data is abstracted and interpreted. With the completion of the interior design studio process, the students' final products reflect a systematic process that integrates design and art.

Findings and conclusion: One of the most crucial requirements for creativity is the ability to come up with fresh, original ideas. According to Stein (1953), creativity should be defined according to the culture it exists in, and "innovation" or "being new" denotes the fact that creative production takes on a new form. As a result of the study, it has been found that the abstraction method, which combines the modern and the traditional and carries the past into the future, plays a key role in the development of the design and the advancement of the design process with the correct steps in the transition from concrete to abstract. With the help of the abstraction model, it has significantly aided in the growth of students' capacity for original and creative problem-solving. Islamic patterns exhibit the mirror quality that reflects the culture of societies because they have historical, cultural, and social meanings in addition to geometric ones. The study's noteworthy contribution to both the recognition of the culture and the increase in awareness and sustainability of the culture for future generations without being imitated has emerged as a result of fusing the traditional with the modern and using Islamic patterns as a design base.

Keywords: Islamic patterns, Creativity, Abstraction, Interior architecture

INTRODUCTION

Through the development of students' analytical thinking, questioning, interpretation, and original design skills, architecture and interior architecture education primarily aims to provide two- and three-dimensional solutions. The development of these abilities requires creative thinking. Since creativity is a skill that can be learned and improved (Robinson, 2001), many studies have proposed various techniques to foster creative thinking. The application of these techniques, particularly in the educational process, promotes the development of various creative outcomes (Kaya & Bilgiç, 2020: 273). The foundations of creative thinking are discovering the potential of cultural and architectural heritage and incorporating it into contemporary life to produce something new and original in problem-solving in design education (El-Zeiny & Ezzat, 2021: 595). One of the original arts that directly influences modern designers' design processes is culture, which serves as the main prototype of modern design. For this very reason, cultural influences are like an endless source of inspiration for modern design and its rich soil that cannot be disregarded (He, 2022). Geometric motifs are widely used in architectural elements, even though they were first used in Anatolian culture in Turks during pre-Islamic times and can be found in every age (Sönmeztürk et al., 2022: 49). Geometric patterns were described by Altın (2022: 531) as motifs and compositions created by combining broken and straight lines, stars, polygons, and other shapes. Patterns, which are quite prevalent in Turkish art, have a sort of defining characteristic regarding the traits of the eras in which they are used and their Fundamentals (Mülayim, 1998: 219).

In various areas (facade, interior, accessories) of contemporary architectural structures, it is now fairly common to copy Islamic patterns (Öztürk & Türkoğlu, 2016). Unconsciously copying and using patterns, however, results in the spirituality of the patterns being lost, simplified and sometimes even disidentified when viewed in terms of the meaning and identity of Islamic patterns. Being traditional without mindlessly copying and reiterating the past, while also being contemporary by interpreting the past without rejecting tradition, is one of the best solutions for modern architecture. Traditional and modern styles of Islamic architecture should

coexist in today's designs (Sobh & Samy, 2018: 1079). For this reason, it is foreseen to carry out researches that can adapt Islamic patterns to modern architecture. Ahmed (2022: 291) emphasized that while researchers and orientalist study geometric patterns' history, technique, philosophy, and other facets, there haven't been enough studies on how to incorporate them into modern life. However, patterns can be used abstractly in modern structures. Different techniques can be used in the educational process to realize the designers' interpretation model by abstracting traditional patterns.

The incorporation of these methods in the educational process is crucial in terms of maintaining the integrity of the link between the past and the present, along with studies on methods based on modern interpretation inspired by Islamic patterns (Latiff, 2012; Bökü, 2009; Özkar & Erkmen, 2019; Azari et al., 2023). It can be seen that Islamic Motifs are used as a base for the development of creativity in the design process, especially in Interior Architecture education when the studies that abstract Islamic patterns and use them in modern architecture in design education (Köse Doğan, 2017; Sobh & Samy, 2018) are examined. In the context of the Interior Architecture project course, Köse Doğan (2017) instructed the students to stylize and reinterpret the motifs present in the Seljuk period structures in Konya and Kayseri to create a unique project. The study's stylized motifs were incorporated into the design of the space's various elements, from lighting to exhibition components. Similarly, El-Zeiny & Ezzat (2021) conduct a study on the function of cultural schemes, which are a reflection of local identity and traditional life, in the interior design process by interpreting them. With the study, it is hoped to develop the next generation of interior architects, who will interpret existing cultural patterns to create modern interiors with more sophisticated solutions while preserving local identity. As a result, a creative thinking model derived from regional motifs can be seen in the design process of interior architecture education, which demonstrates an integrated structure between the past and present.

The study's main issue in this context is that interior architecture education does not provide enough groundwork for creative thinking, despite the prevalence of Islamic patterns that reflect our nation's cultural identity in architectural works. The study aims to reveal original, contemporary lines that are not imitated, as well as to foster creative and abstract thinking by incorporating patterns that carry the spirit of Islamic culture and heritage into the interior design studio process. Students of interior architecture from various parts of the nation were asked to observe Seljuk structures in the cities they reside in and conduct research on the Islamic patterns of the structures as part of the study. It is anticipated that an abstracted motif from the acquired patterns will be used as an input in the design. By abstracting the existing pattern, it is hoped that students will develop the phenomenon of creative thinking as well as knowledge of the historical background of the city they live in. The analytical, creative, and application phases of the design process model, which integrates traditional and modern by abstracting cultural patterns into tangible projects, are crucial.

Conceptual Infrastructure

Significance of abstraction and creativity in interior architecture education

People need to correctly identify, analyze, and comprehend the essence of issues in their environment in order to design. Only the act of abstraction makes it possible to define, examine, and ultimately arrive at the essence of facts and events. Abstraction provides the most important information because concrete facts and events can only provide us with a formal and external reality (Hançerlioğlu, 1993).

By ignoring components like the design or the quality and relationship of a concept, the act of abstraction helps to distinguish the general and the essential from the non-essential in a straightforward manner (Nezor, 2011: 7). To realize the most competent stage of the information process, abstraction is done at this very point. In reality, abstraction is a technique, a tool, used to return to the concrete and understand the concrete whole in its relationships with its constituent parts. Hegel claims that abstraction represents the reality of the being, which is still in its unrevealed state and is just beginning to reveal itself. The abstract and the pure and simple are equivalent in this regard (Hançerlioğlu, 2005). Semantic, functional, and formal abstractions are all handled differently (Nezor, 2011: 65). The indirect expression that characterizes the objects with the accumulation of the individual from the past is a semantic abstraction. These abstractions make use of expressions that indirectly characterize the object and are revealed by its connotations, which the individual associates with her/his own objects. Functional abstractions include space analyses for additional information and drawings comparing the functionality of various spaces to facilitate problem-solving during the design phase. On the

other hand, formal abstraction is the kind of abstraction that results from expressing concrete forms in a way that simplifies them. To describe a concrete form in pure language, one must either reduce it to its geometrical components or use abstract structure lines or contours to describe it. Examples of the formal abstraction type in architecture can be found in the impression sketches and descriptions created during the planning stage of the design process. Such sketches aid in the development of knowledge and methodical thought in architectural education (İnceoğlu,1995). Formal abstraction is a technique used by designers to gather environmental data before beginning their work, to develop ideas for formal searches in their sketches, and to purge designs of unnecessary details (Nezor, 2011: 66). It is possible to claim that abstraction in this situation is creatively revealing. To create a product, the design process oscillates between the abstract and the concrete, rather than just developing at the abstract level. It won't ever be applicable if not. As a result, to produce this increasingly concrete architectural design product, designers cultivate their creativity by alternating between concrete and abstract (Nezor, 2011). One of the key tools for teaching and fostering creativity in the education of designers is abstraction (Robinson, 2001). According to Nezor (2011: 42), by abstracting, architecture students can capture the essence, and create original, creative designs that will boost the designer's creativity and give users a variety of options. Because designers perceive things differently, researchers claim that including abstraction in interior architecture education has a guiding and differentiating effect on design education (Ertürk, 1984). But in today's world, where communication and technology are always evolving, the idea of creativity in interior design is becoming more and more significant (Uzunarslan & Polatkan, 2011).

According to Kılıçaslan and Ziyrek (2012), creativity is a crucial factor in producing original design products in design education, and design education should be improved to foster creativity. Additionally, it was pointed out that creativity is typically assessed in terms of the final product, and it was determined that there are activities that foster students' creativity to advance design education. In the study by Tavşan and Sönmez (2010), some students studying interior architecture received instruction using the abstraction method, while a different group received instruction using the traditional method. With the results obtained, it is evident that the expression activated by the abstraction method is superior to the traditional expression method in terms of raising student achievement and the degree of knowledge permanence. The study's findings (Aşkın, 2020: 121) show that abstraction encourages the development of creative thinking in the design process. As a result, interior architecture students are able to think more deeply and without as many restrictions.

Within the context of one's mental activities, creativity includes the stages of producing and discovering; this process also involves intuitive thinking. The production of preliminary creative structure, preliminary creative discovery and interpretation, production of creative thinking, creative discovery and interpretation, and product development are all parts of this creation process, which is based on production and discovery. The creative process that emerges from these mental activities is concurrently influenced by the personal and cultural aspects of the designer (Smith et al., 1995). These cultural elements, which include Islamic patterns, act as a link between the past and the present.

Islamic patterns and their use in creative thinking in interior architecture education

Due to certain restrictions on the use of human or natural figures, geometric patterns play a significant role in Islam as an art form and for ornamental purposes. Architecture has long utilized geometric patterns, which have evolved over time and place (Reki & Arslan Selçuk, 2018: 83). Islamic art has been shaped by the conditions and traditions of each Islamic state. During the Seljuk eras, architectural creations reflected the growing understanding of Islamic art in Turkish society (Dalağan, 2012: 75). As a result, the primary visual characteristics for designating a structure as having Islamic architecture are Islamic geometric patterns. In addition, these geometric shapes and ratios highlight a crucial area of investigation for modern architecture as a tool for creativity (Matinpour & Arslan Selçuk, 2018: 89). Focusing on this subject, particularly during the designers' educational process, will encourage the development of their creative imagination (Uraz, 1993). Because family, society and education are at the forefront of the development of individuals' creativity (Kaya & Bilgiç, 2020: 283). Education in interior architecture is not organized around a rigid, one-dimensional teaching/learning process. Instead, it is a type of education that requires a framework that points design students toward active, multidimensional thought processes (Cross, 2001). The act of designing interacts with creative thinking as a fundamental component of the educational process. Methods that will support this process and bring creativity to the fore in design gain importance given that design education is a process of

creating, experiencing, and researching (Garip & Garip, 2012). Carrying the past into design by interpreting it rather than imitating it is one of the techniques used in the emergence of creative thinking. Various researchers in interior architecture education have addressed creative thinking as a way to bring the past into the present and to blend the modern with the traditional.

El-Zeiny and Ezzat (2021), using the theory of cultural schema, looked at how incorporating elements from regional identity into contemporary designs affected the graduation project process for interior architecture. With the help of this study, which lays the foundation for how to interpret Egypt's cultural heritage through the interior design process, it has been made apparent that it is possible to integrate the traditional and the modern. Similarly, Köse Doğan (2017) requested that students incorporate interior designs into her interior design project by interpreting Seljuk motifs. Students both learned about Seljuk culture as a result of the study, and they created a three-dimensional interior work using traditional two-dimensional motifs. Incorporating traditional culture into interior design projects not only satisfies modern people's desires for material goods and ideals of living but also creates a perfect marriage with a modern lifestyle that abstracts their traditional cultural beliefs and values (Liu & Li, 2016: 11110). As a result, creativity must be fostered in the transforming cultural heritage brought about by evolving technology (Angelina et al., 2021: 1132). Islamic motifs' importance in design education cannot be understated because they are a result of the culture of the society in which people live.

METHOD

In order to foster creative thinking in design education, this article focuses on the idea of developing a design module by abstracting Islamic patterns. Some societies' Islamic patterns have social, cultural, and historical significance in addition to their visual appeal. Therefore, within the context of the Interior Architecture studio course, a model has been developed to ensure the integration of the traditional and the modern in an integrated system. A design process based on Islamic patterns has been tried to be examined by using this model in design education. The right steps should be used to support the design process, which is described as the order of actions made up of the tools and techniques used during the design (Lawson, 2005: 33). In the course of analysis, synthesis, and development, the pattern is abstracted as a result of data collection efforts intended to address the issue. Designing each stage of the design process with a flexible structure that can accommodate feedback is a good idea. A feedback loop between stages of the design process is recommended by Archer (1984) and Cross (2005: 35-36). The three main phases of the proposed processes are "analytical", "creative", and "implementation" (Figure 1).
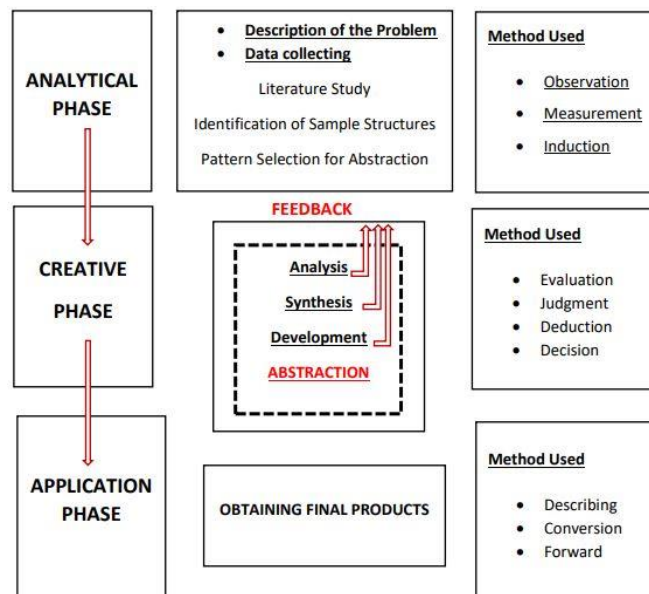
Figure 1. The design process used in the study

Interior Architecture Studio Process

In the study, Selcuk University Faculty of Architecture and Design Interior Architecture Project II studio, within the scope of the 2021-2022 spring semester, the interior design of the store (textile, cosmetics, sports) where the products of world-famous brands are exhibited using Islamic pattern patterns were given to the students as a project subject. It aims to demonstrate various viewpoints on creativity and abstraction in this context. The abstraction action that was mentioned in the study was formal abstraction; functional and semantic abstraction were not included. It aims to allow students to discover learning based on the process of an interior design studio and to forge a connection between the past and the present. The students were given restrictions in the design so they could create a path. Islamic patterns placed restrictions on the Seljuk periods. Students were asked to use the Islamic pattern in that city as a design inspiration based on the premise that the stores to be designed could be located in any city in our nation. Students visited Seljuk period buildings in the cities they lived in to gather information during the analytical phase, which is the first phase of the study. The students also looked at the motifs found on carpets and rugs from the time period in question. Following the test, the students discussed their findings and prior knowledge of Islamic patterns in the studio setting and exchanged information. Later, they finished the analysis stage of the design process by arbitrarily selecting one of the Islamic motifs they had looked at to create formal abstraction. The part-whole relationship was used to evaluate the Islamic motif that was chosen during the creative phase, and it was then simplified by interpreting. Flashbacks encountered during the abstraction process have led to the motif's essence. The application phase was finished by incorporating the acquired original state as a design element in the store's facade and at various locations inside.

FINDINGS

In the study, the stages of the concept of abstraction in design were tried to be conveyed to the students in the process of original and creative design. The students realized the act of abstraction with the method of the concept of abstraction in design with the Islamic patterns they identified through materials such as architectural artifacts, ruins, and equipment. The act of abstraction in space design aims to provide students with original thinking skills. This helps students to produce creative designs that respond to the unique needs and cultural values of users, rather than simply conforming to standard design templates. In the first phase of the study, the appropriateness of the Islamic patterns found by the students with various alternatives was emphasized and the abstraction phase of the selected pattern was started. The study was carried out in five stages and these stages are shown in Figure 2.
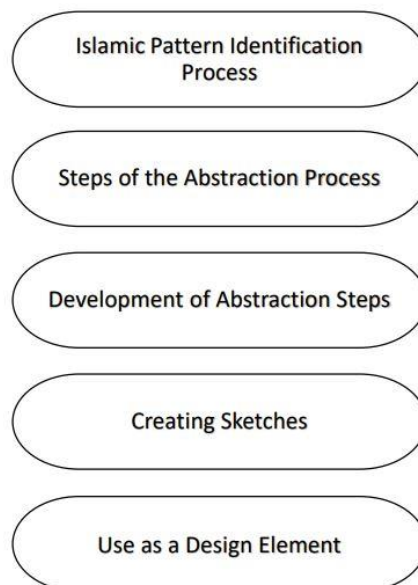
Islamic Pattern Identification Process

Steps of the Abstraction Process

Development of Abstraction Steps

Creating Sketches

Use as a Design Element

Figure 2. Project implementation phases

While applying the abstraction phase in the design, Arnheim's (2015) abstraction relationship between pictures and symbols was taken as a basis. The study is based on the evaluation, analysis, and interpretation of all the data belonging to the design problem and their relationships with each other.

The abstraction alternatives made by the students were realized in four stages, discussed and interpreted within the scope of the project lesson. The Islamic pattern showing the stages of abstraction and the steps of abstraction are given in Figure 3.

Alaaddin Mosque /Konya

Original State of the Pattern   Stages of Pattern Abstraction
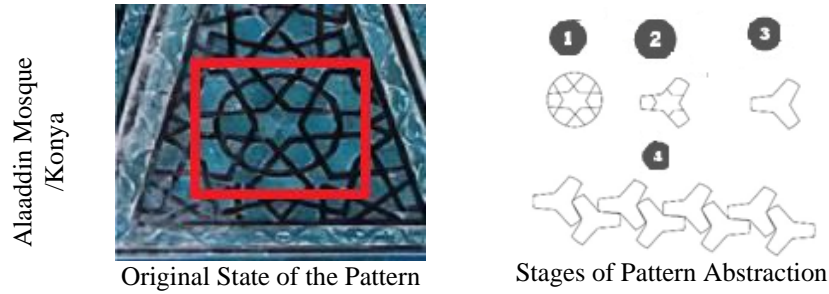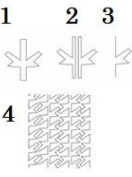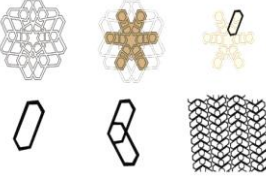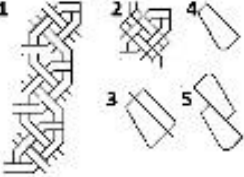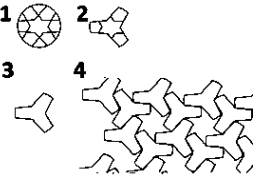
Figure 3. Islamic Pattern Abstraction Example

Changes/transformations have occurred in the forms and proportions of Islamic patterns, allowing abstraction to reach authenticity. With the Islamic patterns becomin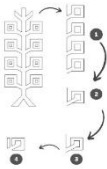g simpler and free of ornamentation, a design process was realized in which traditional traces were maintained on the contemporary store interior and facade surfaces (Table 1). Thus, while reaching the final product in the design process, the abstraction method plays an important role in the formation of the design in the transition from concrete to abstract. The concept of creativity, which is associated with original thinking in the abstraction of Islamic patterns, shows that different results are obtained from person to person. In this case, it is thought that many factors such as the cultural experience that designers have physical and social characteristics are effective in creativity.

Table 1. Interior architecture studio process and final products

Project Designers	Analytical Stage (Data Collecting)	Creative Stage (Abstraction)	Implementation Phase	
			Shop Facade Suggestion	Shop Interior Suggestion
Yasemin Dişçi Maisalrim Khattab Channel Store	Afyon Ulu Mosque Wooden console scarves between cardigan pattern			
Merve Çakmak M.Metehan Uyanık Dolce Gabbana Store	Ince Minaret Madrasa Konya Bayındır stamp			
Melike Öztürk Gökçe Öncel Alexander McQueen	Ram horn motif			
Başak Yazgan Merve Nur Çukuryer Steiff Store	Konya Alaeddin Mosque pulpit			

Gülser Uysal Selcan Çamoğlu Prada Store	Konya Owner Ata Mosque crown gate			
İbrahim Şahin Bayram Çelik Rolex Store	Amasya Yörgüç Pasha Mosque window wing woodwork			
Zeynep Kodaloğlu Ruveyda Esra Hekimoğlu Patchi Store	Aksaray Sultanhanı Caravanserai arch edges crossing (zencerek) motif			
Kader Deniz Çoban Fadime Çukur Adidas Store	Konya Alaaddin Mosque			
Derya Nur Kemikli Hatice Sena Kocatürk Teslime Eda Yılmaz	Tree of Life Motif			

This is comparable to the research accomplished by Kılıçaslan and Ziyrek (2012) on the teaching of creativity in interior architecture. However, while deciding to use the Islamic pattern, details about the local identity and culture were learned through techniques like actually seeing the architectural structures, making observations, and taking pictures of them. As a result, recognizing cultural heritage and investigating the potential of patterns for design, complements the work of El-Zeiny and Ezzat (2021). Another finding from the same study shows similarities to research that has greatly aided the education of interior architects in a variety of designs by interpreting cultural diversity. As a result, more study is necessary to fully understand and interpret the geometric structure of Islamic patterns, as stated by Ahmed (2022) and Fatihaddin et al., (2018).

CONCLUSION

One of the most crucial requirements for creativity is the ability to come up with fresh, original ideas. As a result, one of the qualities a design student should possess is creativity. It is crucial to incorporate the designs that students envision in their minds with culture to strengthen the connection between the past and the present in order to foster creativity in design education. According to Stein (1953), creativity should be defined according to the culture it exists in, and "innovation" or "being new" denotes the fact that creative production takes on a new form. Existing information or material may require new integrations, but must also contain new elements (as cited in Öncü, 1992).

In the past and present, societies have used a variety of geometric patterns to express their history, culture, and traditions in a variety of design contexts, including textiles and architecture. These patterns' underlying meanings reveal cultural influences. Traditionality and locality are in danger of becoming extinct in every aspect of contemporary life, which is uniformizing as a result of globalization. Researchers have emphasized maintaining the identity of the current culture while preserving its meaning and passing it on to future generations without being copied for this reason. As a result of the study, it has been found that the abstraction method, which combines the modern and the traditional and carries the past into the future, plays a key role in the development of the design and the advancement of the design process with the correct steps in the transition from concrete to abstract. In the study, a design education process was carried out to draw attention to the concepts in question for students studying design, in order to address the problem of not being able to integrate cultural and local traces into contemporary life. With the help of the abstraction model, it has significantly aided in the growth of students' capacity for original and creative problem-solving. Islamic patterns exhibit the mirror quality that reflects the culture of societies because they have historical, cultural, and social meanings in addition to geometric ones. The study's noteworthy contribution to both the recognition of the culture and the increase in awareness and sustainability of the culture for future generations without being imitated has emerged as a result of fusing the traditional with the modern and using Islamic patterns as a design base. The process of getting design products that are plain, free of ornaments, and made with essential geometric shapes has also positively impacted the designers' creativity. This is because Islamic patterns have a strong aesthetic appeal that transcends time and space as well as language and culture. The patterns may not resemble Islamic motifs due to "contemporary" touches. However, the underlying structure of the geometries is the abstraction of traditional Islamic patterns. Thus, this study is important in terms of contributing to the production of new forms of design strategies and ideas in interior architecture education and the physical evolution of the traditional towards the modern. The abstraction of patterns is not a rupture, but in fact a step of self-discovery. Thus, it creates a form that not only encompasses traditional Islamic design, but also allows these designs to evolve with contemporary interiors as a new and additional art of Islamic geometries. The endless pattern-making process of Islamic geometric art offers a rich blend of cultural background, the origin of geometries and a contemporary view of exploration. The intuitive impulse to adapt to contemporary practices takes on a role that allows it to become a hallmark and signature of the designer who created it.

As a result, the modern design environment is a platform that provides distinctive solutions that holistically integrate the past and present. The importance of the study in the scientific platform is expressed by researching various cultural elements, developing a model through the application, and incorporating them in the design process through the interior design studio. The concept of incorporating and developing the said approach in the educational process of various design disciplines should be expanded to increase the number of original and creative designs inspired by the cultural data of societies. Additionally, the study enhances the students' design skills as they learn interior architecture within the context of the design process.

REFERENCES

Ahmed, H. T. (2022). Utilizing Islamic geometric abstraction aesthetics in creating designs for mosque architectural decoration. *International Design Journal, 12*(5), 291-302. https://doi.org/10.21608/idj.2022.261006

Altın, A. (2022). Eratna Beyliği taçkapılarında geometrik süsleme [Conference presentation]. *XVIII*th *Turkish Congress of History*, October 1-5, Ankara.

Angelina, A., Irawan, H. & Mariana, M. (2021). The application of Balinese decorative pattern in lobby and guest rooms at the amnaya's kuta hotel & resort interiors. *Advances in Social Science, Education and Humanities Research,* (570), 1132-1137. http://doi.org/10.2991/assehr.k.210805.178

Archer, B. (1984). *Systematic method for designers, developments in design methodology* (Ed. N. Cross), p.57-82. John Wiley & Sons Ltd. https://doi.org/10.1088/1757-899X/962/3/032037

Arnheim, R. (2015). *Görsel düşünme*. Metis Yayınları.

Aşkın, G. D. (2020). *İç mimarlık eğitimi temel tasarım sürecinde yaratıcı düşüncenin geliştirilmesine yönelik bir yöntem önerisi* [PhD Thesis, Mimar Sinan University].

Azari, M. R., Bemanian, M., Mahdavinejad, M., Körner, A. & Knippers, J. (2023). Application-based principles of Islamic geometric patterns; state-of-the-art, and future trends in computer science/technologies. *A Review, Heritage Science*, *11,* Article 22. https://doi.org/10.1186/s40494-022-00852-w

Bökü, A. (2009). *Biçim grameri türetme yönteminin Anadolu Selçuklu geometrik bezemeleri üzerinde denenmesi* [Master Thesis, Yıldız Technical University].

Cross, N. (2001). *Design cognition: Results from protocol and other empirical studies of design activity.* In Newstetter, W.C., East- Man, C., Mc Cracken, W. (Eds.), *Design Knowing and Learning: Cognition in Design Education.* Elsevier Science, 79-124. https://doi.org/10.1016/B978-008043868-9/50005-X

Cross, N. (2005). *Engineering design methods Strategies for Product Design* (Fourth Edition). Wiley.

Dalağan, V. (2012). *İslâmî yıldız geometrik örüntülerin biçim grameri yöntemleri ile kurallı üretimi* [Master Thesis, Yıldız Technical University].

El-Zeiny, R. M. A. & Ezzat, D. M. S. (2021). The role of education in achieving local identity-based interior design by utilizing cultural schema. *Interstices Journal of Architecture and Related Arts*, *6*(30), 594-615.

Ertürk, S. (1984). *Mimari mekânın algılanması üzerine deneysel bir çalışma* [PhD Thesis, Karadeniz Technical University].

Fatihaddin, D., Eves, B. & Gashoot, M. (2018). Implementing islamic patterns in interior design to enhance the spiritual aesthetic. *Islamic Heritage Architecture and Art, 177*(11), 137-147. https://doi.org/10.2495/IHA180111

Garip, E. & Garip, S. B. (2012, 20 December). İç mimarlık eğitiminde yaratıcılık ve yarışmalar [Conference presentation]. *İÇMEK / İçmimarlık Eğitimi 2. Ulusal Kongresi*, İstanbul, Türkiye.

Hançerlioğlu, O. (1993*). Felsefe ansiklopedisi kavramlar ve akımlar*. Remzi Kitabevi.

Hançerlioğlu, O. (2005). *Felsefe ansiklopedisi kavramlar ve akımlar.* Remzi Kitabevi.

He, J. (2022). *Applied research on cultural elements in interior design* [PhD Thesis, University of Pecs].

İnceoğlu, N. (1995). *Düşünme ve anlatım aracı olarak eskizler*. Helikon Yayınları.

Kaya, P. & Bilgiç, D. E. (2020). The process of creativity and concept development in interior architecture design education. *The Turkish Online Journal of Design, Art and Communication – TOJDAC, 10*(3), 271-284.

Kılıçaslan, H. & Zirek, B. E. (2012). A research about creativity in design education. *Social and Behavioral Sciences* (46), 1461-1464. https://doi.org/10.1016/j.sbspro.2012.05.321

Köse Doğan, R. (2017). A project model in interior architecture: from patterns to spaces. *Global Journal of Arts Education*, *7*(2), 40-46.

Latiff, A. A. Z. (2012). *Dakwah dan polilik dalam gerakan Islam di Malaysia.* Penerbit UiTM. https://doi.org/10.24952/tad.v2i1.2482

Lawson, B. (2005). *Route maps of the design process, how designers think*. Architectural Press.

Liu, Y. & Li, B. (2016, November 22-24). Research on traditional cultural elements penetrating into interior design. *International Conference on Education, Sports, Arts and Management Engineering* [Conference presentation].

Matinpour, M. & Arslan Selçuk, S. (2018). İslami geometrik desenlerin origamik potansiyelleri: altıgenler üzerinde bir deneme. *EJONS International on Mathematic, Engineering and Natural Sciences, 2*(3), 88-101.

Mülayim, S. (1998, May 27-31). Tanımsız figürlerin ikonografisi, türk soylu halkların halı, kilim ve cicim sanatı [Conference presentation]. *Uluslararası Bilgi Şöleni Bildirileri,* Ankara.

Nezor, S. (2011). *Mimarlık eğitimi ve soyutlama* [Master Thesis, Karadeniz Technical University].

Öncü, T. (1992). Yaratıcılığın betimlenmesi ve yaratıcılık üzerine çevresel etkiler. *Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Felsefe Bölümü Dergisi,* (14), 255-264.

Özkar, M. & Erkmen, A. (2019). Ortaçağ Anadolu sanatı araştırmalarında disiplinlerarası çalışmalar: Geometrik örüntünün gelişen teknolojilerle yolculuğu. *Akdeniz Sanat Dergisi,* (13), 545-556.

Öztürk, S. & Türkoğlu, T. M. (2016). Anadolu Selçuklu sanatı geometrisinin günümüz kent estetiğinde uygulanabilirliği (Konya ili örneği). *İdil,* 6(28), 167-198. https://doi.org/10.7816/idil-06-28-11

Reki, M. & Arslan Selçuk, S. (2018). Evolution of geometric patterns in Islamic world and a case on the Jalis of the Naulakha pavilion in the lahore fort. *GU, J SCI, 6*(1), 83-97.

Robinson, K. (2001). *Out of our minds: Learning to be creative*. Capstone Publishing Ltd.

Smith, S. M., Ward, T. B. & Finke, R. A. (1995). *Creative cognition approach*. MIT Press.

Sobh, H. & Samy, H. A. (2018). Islamic geometric patterns as timeless architecture. *Journal of Al Azhar University Engineering Sector, 13*(48), 1074-1088. https://doi.org/10.21608/auej.2018.18946

Sönmeztürk, G., İşbilir, S. & Göçer, M. (2022). Selçuklu yıldız motifinin Mersin Olgunlaşma Enstitüsü'nde sanatsal tasarımlara yansıması. *Mersin Sosyal Bilimler Enstitüsü Dergisi, 6*(1), 48-60. https://doi.org/10.55044/meusbd.1194796

Tavşan, F. & Sönmez, E. (2010, November 25-27). İç mimarlık eğitiminde yeni öğretim modeli arayışları; mobilya tarihi dersinde sembol ve soyutlama [Conference presentation]. *Mimarlık Eğitiminin Dünü Bugünü Yarını Sempozyumu*, Konya.

Uraz, T. U. (1993). *Tasarlama düşünme ve biçimlendirme*. İ. T. Ü. Mimarlık Fakültesi.

Uzunarslan, Ş. & Polatkan, I. (2011, April 27-29). İç mimari tasarım eğitiminde yaratıcılık etkinlikleri [Conference presentation]. *I. Sanat ve Tasarım Eğitimi Sempozyumu "Dün, Bugün, Gelecek"*, Ankara.

Figure References

Figure 1: According to Archer (1984: 64) and Cross (2005: 35), edited by the authors.

Archer, B. (1984). *Systematic method for designers, developments in design methodology*, (Ed.Cross, N.), John Wiley & Sons Ltd., 57-82. https://doi.org/10.1088/1757-899X/962/3/032037

Cross, N. (2001). *Design cognition: results from protocol and other empirical studies of design activity.* In: Newstetter, W.C., East- Man, C., Mc Cracken, W. (Eds.), *Design Knowing and Learning: Cognition in Design Education.* Elsevier Science, 79-124. https://doi.org/10.1016/B978-008043868-9/50005-X

Authors' Biography

Ali Akçaova received his bachelor degree from Selçuk University, Faculty of Fine Arts, Department of Interior Architecture (2012). He completed his master degree in the joint master program of Selçuk University and Hacettepe University (2016). He received his doctorate degree from KTO Karatay University, Department of Architecture, Faculty of Architecture (2016-2023). In 2015, he started to work as a Research Assistant at Selçuk University. In 2023, he was appointed as a Faculty Member. His main research interests include architectural design, computer-aided design, design and art history.

Mine Sungur is Asst. Prof. Dr. in the department of Interior Architecture at Selcuk University. She completed her Bachelor of Science (B.S.c) and Master of Science (M. Sc.) degrees in building design from Selcuk University. In 2020, she received her PhD Degree about spatial privacy in residences in Konya Technical University. There are many publications and project applications about residences design, spatial quality, interior design education.