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Research Article

An examination of three key elements in the design studio: A case study of the fourth-year studio

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Abstract
The paper aims to unveil the interdependent nature of the studio's physical settings, the design challenges presented, and the interactions between its inhabitants. This examination seeks to contribute to the enhancement of architectural education by providing insights into the potential improvements in studio-based learning, thereby supporting a more effective and comprehensive educational model in the field of architecture. The scope of this study focuses on three parameters that define the design studio. These are the studio environment, design problems and inhabitants. The study elucidates the significance of these parameters in issuing a case study of a fourth-year architectural studio focusing on historical sites in Izmir, Turkey. The method of the research adopts a co/autoethnographic approach to explore how these elements influence the learning experience and outcome. As a result, this study investigates the dynamics within architectural design studios, emphasizing the symbiotic relationship between the learning environment, the interaction among students and instructors, and the design problem.

Keywords: Design studio elements, Architectural education, Design problem, Learning environment, Studio-based learning

Extended Abstract

Introduction: The architectural curriculum combines lecture-based and studio-based courses to foster a comprehensive learning experience. Central to this curriculum is the studio environment, emphasized as a vital element for teaching the design process across most architectural schools (Goldschmidt et al., 2010; Kurt, 2009). Studio-based courses leverage experiential learning methods, including learning-by-doing and project/problem-based learning, to simulate real-life design challenges (Bridges, 2006; Taneja, 2022; Karaveli Kartal & Arıoğlu, 2024). The diversity in instructors' knowledge and teaching styles, along with students' varying thinking processes and learning styles, significantly influences the learning outcome (Goldschmidt et al., 2010; Coia & Taylor, 2009). The design brief, which outlines the design problem and its requirements, is crucial for initiating the learning process in an architectural design studio, as it

provides guidance, promotes creativity, and challenges students to think critically and develop new solutions. As a physical space, the design studio serves as a dynamic environment where students engage in their work, even often extending their presence beyond the lecture hours (Abdelaziz, 2021: 85; Oh et al., 2013). The physical characteristics of the environment affect the performance of inhabitants, such as overcrowding or acoustics. This paper delves into a fourth-year architectural studio as a case study, considering the evolving nature of a design studio shaped by inhabitants (students and instructors), design problems (the design process and/or design outcome), and the physical environment.

Purpose and scope: The purpose of this study is two-fold: firstly, to investigate the interplay between key components within the architectural design studio, namely, the inhabitants (students and instructors), the design process (and/or outcome), and the physical environment and secondly, to examine how these components collectively influence the learning experience and outcome in a fourth-year architectural studio setting. Through this exploration, the study aims to uncover whether these elements function as independent variables or are intertwined and affect each other within the design learning process. The scope of the research is confined to a fourth-year architectural design studio, leveraging this setting as a case study to conduct a thorough examination. This paper focuses on the interaction between students and instructors from the instructors' perspective. The paper aims to establish connections among the three critical actors for the design studio: the design problem (as the central topic), the inhabitants (comprising students, lecturers, and juries), and the environment. The paper seeks to facilitate a comprehensive understanding of the dynamics within these issued topics through this approach. The paper begins with the introduction of the key elements emphasizing the significance of a multifaceted approach. Then it explains the method used throughout the research. It introduces the brief by defining the design subject, followed by the location, architectural program, and concludes with a weekly schedule. Then, it details the design studio's elements and analyzes them to understand these dynamics. Finally, a discussion on outcomes, possible implementation, and improvements in an architectural design studio is presented.

Method: A narrative guide model was proposed for use in the design process as a result of theoretical research. The main framework of this model was designed with Ricoeur's theory, which was developed by problematizing Aristotles concept of mimetic activity and defining it as triple mimesis. The subframes of the guide model need to expand on the components of the narrative to answer the question; what should narrative include during the design process. At this point, for the narrative production, resources are used to develop strategies to make the components detailed by Ricoeur through actions more defined. Through these reviews, the necessary information for the narratives can be selected and added to the guide during the design process. The broad framework drawn with tactics and content has been summarized and made unique to be included in the guide. As a result, a narrative guide proposal that allows imaginary expeditions to turn into narratives is presented. The guide was tested in the design studio, and participants were asked to create narratives using the guide during the design process. Subsequently, the narratives were analyzed using the thematic analysis method, specifically the examination with codes and themes approach. The "character, action, context, and situation" codes represent the narrative components. These codes helped to identify how the guides components were incorporated into the narratives written in the studio. The analysis identified themes such as narrative integrity, intermediate narrative spaces, development intervals, and their impact on the design. By interpreting these themes, conclusions were drawn regarding the effectiveness of the written narratives in the design process.

Findings and conclusion: This article examines the interconnection of three key elements in a design studio: design issues, residents (instructors and students), and the physical environment. A case study of a fourth-year architectural design studio focused on historical sites in Izmir, Turkey, reveals a complex interplay between these elements. The discussion examines the designer's interaction with historical sites as complex relationships, including preserving natural and historical elements, without ignoring contemporary architectural practice and the influence of studio instructors' backgrounds on these interactions. In the exploration and interpretation of the relationships opened up through the design problem, two additional factors have been considered: instructor attitudes and environmental relations. This study suggests that the construction of the syllabus is not solely based on design problems; rather, it should also consider the background of the instructor, which encompasses different histories and relationships with architecture. The teaching styles of instructors influence the outcome of the studio and their approach to the students, creating differences in the grading scales It has been observed that the students demand a more authoritative approach. Also, the expansive use of the physical environment and high classroom interaction affect the outcome. The study highlights the importance of a well-balanced and integrated design studio environment. Harmony in the dialog of inhabitants (instructors and students) is crucial for a fruitful learning experience. Likewise, extensive use of the physical environment encourages interaction between inhabitants. For further studies this relationship can be analyzed using qualitative methods that refine the relationship between these three elements. From the point of view of conservation, a more specific design problem based on repurposing a heritage building may increase the importance of cultural preservation. Also, a more in-depth study can be conducted to better understand if the expertise of an instructor affects the outcome due to the shared knowledge.

Keywords: Design studio elements, Architectural education, Design problem, Learning environment, Studio-based learning

INTRODUCTION

The architectural curriculum includes both lecture-based and studio-based courses that are complementary. Design process is taught in a studio environment, which is the center of the architectural curriculum in the majority of architectural schools (Goldschmidt et al., 2010; Kurt, 2009). Studio-based courses generally employ experiential learning methods where pedagogical models such as learning-by-doing or project-and/or problem-based learning are implemented (Bridges, 2006; Taneja, 2022; Karaveli Kartal & Arıoğlu, 2024). Some scholars advocate for an alternative approach to this learning environment, suggesting use of diverse methods to enhance the educational experience (Kurt, 2009). The aim of these studio-based design courses is to create a learning environment where students can learn both the profession (Taneja, 2022) and the design process (Khaleghimoghaddam, 2023). Therefore, a project- and/or problem-based learning approach is generally adopted because it allows to simulate possible real life design problems. The learning process is affected by different identities of both the instructors and students - the *inhabitants* of the studio. Instructors can have different knowledge, based on their expertise of being a researcher and/or professional. They also have different teaching profiles that affect the knowledge transfer towards students (Goldschmidt et al., 2010; Coia & Taylor, 2009). And according to Khaleghimoghaddam (2023: 88), students' *thinking process* and *learning styles* are also effective factors in their learning process.

This process of learning is initiated by a *design problem*, which is presented as a brief that frames the problem by stating the requirements and desired outcomes (Koronis et al., 2021). According to Koronis et al. (2021), a brief should provide guidance and direction to promote creativity. At the same time, it should promote the development of new ideas and also broaden students' problem-solving skills by presenting a different perspective to a problem. An architectural design studio is generally challenging to students due to the nature of the educational setting but also because of the limited and kind of ambiguous nature of the design problem (Koronis et al., 2021). As a *physical space*, the design studio is where students spend most of their time learning, experimenting, working, and sometimes even living - sleeping and/or eating while working (Abdelaziz, 2021: 85; Oh et al., 2013). The physical properties of this studio space also affect the performance of the inhabitants by being too crowded or too noisy due to the acoustics.

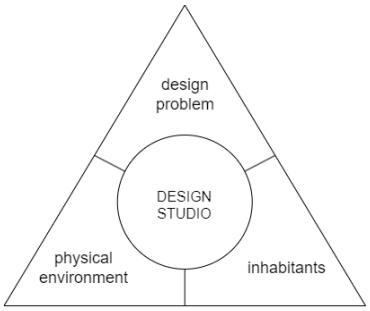


Figure 1. Elements of the design studio

To sum up, the architectural design studio is a dynamic and ever-evolving repository of knowledge that is shaped by the *inhabitants* (students and instructors), *design problems* (the design process and/or design outcome), and finally, the *physical environment* (Figure 1). Therefore, this paper presents a fourth-year architectural design studio where these elements conjoin together to affect each other and create a knowledge repository.

As mentioned above, the design studio functions as a dynamic environment with numerous factors emerging throughout and beyond the studio process. The research seeks to examine the emerging characteristics and solutions within the context of a design studio. To address the research question, the study employs a case study methodology, focusing on the studio environment itself to identify and characterize its unique attributes within the framework of the three specified elements. In this research, the design studio is systematically observed. The figures presented in the research aggregate multiple data points to facilitate a comprehensive analysis. The three elements under consideration are not discrete entities; rather, observational data and literature reviews indicate that they frequently intersect and interact. Additionally, the research explores the correlations within the design studio, re-assessing these relationships through discussions.

METHODOLOGY

Do the elements of a design studio affect each other? Or are they independent variables within the design learning process? To understand the relations of design studio elements, a fourth-year design studio course was used as a case study and within this case study, data gathering and analysis were conducted using co/autoethnographic (Coia & Taylor, 2009) method. This method consists of a process of writing, discussion and feedback within a collaborative framework (Coia & Taylor, 2009). It was used a self-evaluation of the view to the design problem and students' approach to it, as it has been used by Boling et al. (2020: 1871). Collaborative sessions were conducted each week, discussing the progress of each group. These sessions revealed our differences in how each instructor approached the problem and how each instructor's expertise changed the narrative of the desk critiques. This research believes that these differences lead to new relations that allow a different perspective to emerge and a better understanding of the complexity of the design studio.

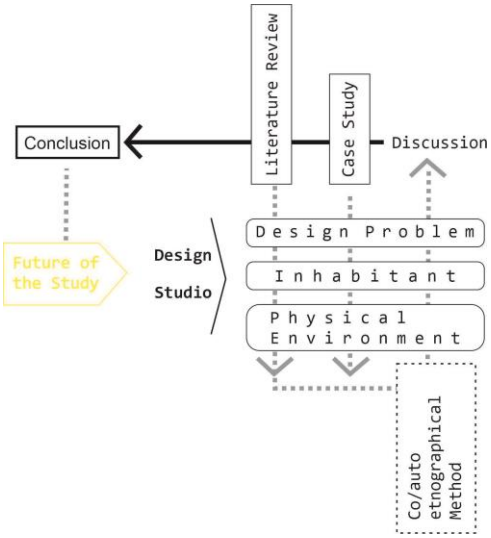


Figure 2. Method and structure of the research

Thus, the aim of the paper is to establish connections among the three key actors for the design studio: the design problem itself (as the central topic), the inhabitants (comprising students, lecturers, and juries), and the environment. In Figure 2, the structure and method of the research is illustrated. Through this approach, the paper seeks to facilitate a comprehensive understanding of the dynamics within these issued topics. The approach/connections between the elements are presented from the instructors' point of view primarily relying on interpretation and discussion of each student's project.

Case Study

The approach to the design studio elements: design problem, inhabitants and physical environment are observed and studied (analyzed) within a 4th-year architectural design studio. This studio, offered at Manisa Celal Bayar University, is the fifth design studio taught in the architecture program of the Faculty of Fine Arts, Design and Architecture. The main goal of this studio is to develop a conservation approach for the cultural heritage elements as well as a meaningful approach to urban context. Cultural heritage serves as the overarching theme for this studio, where the specific site and design problem subject may vary each year, but a connection to cultural heritage will persist. Also, this subject has been selected due to the importance of protecting and conserving cultural heritage.

Process of Design Studio

The 15-week studio process fundamentally consists of 4 steps. Firstly, analyzing the project area and its surroundings, concept design, initial phase design considering urban relations, and detailing the project. There were 3 groups formed by two instructors with different expertise, creating a small jury like critiques. This studio was organized as a vertical studio which means that two different levels of design studio were conducted simultaneously. And this led to having different numbers of students from different levels for each group.

Weekly schedule: The first three weeks of the curriculum are dedicated to the site analysis phase, which includes two site visits. Additionally, one of the field trips was made to get to know the study area and its surroundings, while the other trip included visiting and examining similarly repurposed historical buildings as examples. The analysis phase ended with the students' presentations and panel review in the third week.

After the analysis phase, the concept design and preliminary design phases began. At the same time, they started their preliminary designs with mass searches using sketches of the site plan. At the end of the sixth week, while the preliminary design phase continued, the concept design phase ended with a panel review. In the preliminary design phase, students were asked to bring their concept design and initial ideas together to create a primary site plan with a scale of 1/1000. Also, students were asked to present more detailed plans, sections, and silhouettes of their initial design ideas on a scale of 1/500. At the end of the ninth week, this stage is completed with an individual desk review of all the drawings.

The final phase of the curriculum lasts six weeks, including an interim review conducted during the eleventh week as well as an assignment with the requirement of a complete drawing set for the last week before the final review. Detailed site plan design with a scale of 1/500, floor plans and sections with a scale of 1/200 as well as detailed plans of specific areas with a scale of 1/100 were studied in this phase. The final review has been conducted at the end of the fifteenth week.

Studio Critiques: A design studio is a simulation of a design problem that architects can face in a professional setting. Thus, within the studio, as in professional life, there is a search for answers to the design question(s). The possible answers, and sometimes even new questions, are simulated by exchanges between studio elements. One of these exchange methods is "critiques", which are discussions between inhabitants (instructors and students) surrounding the design question. Critiques are core activities of a design studio that stimulate both parties and push the limits of creativity in search of an answer. Multiple critique methods are employed in a design studio (Oh et al., 2013; Abd El-Latif et al., 2020). Some of the most used methods are desk critiques or one-on-one critiques and panel reviews, a setting where students present their project in front of instructors, peers and professionals. Throughout this studio, panel reviews were conducted only at the culmination of each phase, while one-to-one desk critiques were employed during the remaining weeks. Instructors actively promoted peer critiques and group discussions among students.

FINDINGS: ELEMENTS OF DESIGN STUDIO

The paper explores various notions that serve as fundamental frameworks for the architectural design production process, particularly within this studio context. Within the case study, key terms are defined to elucidate their role in the representation of design. These terms encapsulate dual perspectives, serving not only as criteria and categorical representations of complex thought processes but also as embodiments of designers' performance and effort in presenting ideas effectively.

The architectural design studio, as stated before, is composed of three elements, first the design problem which is the framework of the process. The second is the inhabitants, the students, and the instructors, thirdly the physical environment, the classroom itself. This study investigates the influence of three elements on an architectural design studio: the design problem, the inhabitants, and the physical environment. Each element of the design studio is explained separately to understand each one' properties, then how they have been applied within the case study is explained.

Design Problem

Design problems are the keystone that promotes a conversation between the inhabitants (students and instructors) of the organism. This dynamic exchange is created by critiques (crits) or presentations of students' own works to a panel of other students, architectural professionals and/or instructors. Crits are the feedback provided by the instructors to the students' work by questioning their answers to the design problem. Simultaneously, they are used as an assessment method by the instructors (Abd El-Latif et al., 2020; Oh et al., 2013). Creativity and functionality are integrated, producing a value as space (Sarkar & Chakrabarti, 2011). While the limitations are also boundaries for the context, they are also challenged in a progressiveness of the

abstract to factual process of the design studio. The design proposals for the projects have been limited due to the constraints imposed by the area under study and the rules governing the context.

The definition of creativity focuses on certain elements such as novelty and usefulness, with less emphasis placed on form and aesthetic development. Functions, images, and usefulness are general mediums through which designers express their novelties (Han et al., 2019). Beyond the aesthetic appreciation of architectural projects, the developmental logic of design relies on creating a programmatic link and continuity. The research positions the creativity of the designer within the term "*scenario*," challenging designers not only with functional necessities but also prompting them to consider continuity, thereby encouraging thinking beyond the programmatic constraints. The success of a well-established scenario reveals the function and unexpected aspects of the project.

Scenarios and conceptual references serve as the creative focal points from the designer's perspective. However, this realm of creation is constrained by the historical context of the site and is further delineated by the structured analysis conducted by the designer based on the syllabus. Despite these limitations, the medium for unique creation is minimized, and the visionary scenarios developed by designers are functionalized as solutions to design problems. As Coyne emphasizes, creativity and creative thinking are strongly linked to non-routine situations, indicating complex integrational circumstances (Coyne, 1997). The project, in a way, generates a complex design problem across different layers of practice, political, practical, and philosophical. Yet, the manner in which the studio engages with this problem remains open to speculation and critiques.

Fourth-year design studio: The design problems given within this studio involve a complex framework that includes building functions and areas, requirements for the built environment, and site context, which encompasses urban, cultural, social, environmental, and historical factors (Abdelaziz, 2021: 88). Despite the given designation of "Cultural Heritage Academy" for the building's function, the students must propose the functional requirements based on their respective scenarios. The Cultural Heritage Academy should provide research and education facilities for a İzmir-specific tangible or intangible heritage. The main goal of this studio is to develop a scenario and program for the conservation of tangible and intangible heritage as well as a conservation approach for the cultural heritage elements in the historical urban context. Hence, the students had to provide innovative solutions for a modern building design near historical buildings and refunctioning the existing historic buildings. Cultural heritage serves as the overarching theme for this studio, where the specific site and design problem subject may vary each year, but a connection to cultural heritage will persist. Therefore, a site with cultural heritage properties has been selected so that conservation approaches can be discussed in a design problem setup. Also, the design problem encompasses the challenges associated with addressing issues within a historical urban context. The studio's design area is in the Akdeniz District of Konak, Izmir, Turkey. This region is included in the Historical Port City of Izmir on the UNESCO World Heritage Tentative List. The neighborhood has served as the urban focal point for historic commercial and social endeavors. The study area is a listed urban area that has lost its historical heritage features in terms of urban texture but still contains cultural heritage elements from different historical periods. Despite the contextual limitations, the design problem holds significant potential and data that depend upon its specific surroundings. The potential of the environment could also allow for a variety of solutions.

The design problem can be characterized as an ambiguous and complex wicked problem (Abdelaziz, 2021: 84). The design problem can be also identified as an educative or pragmatic problem for the students. While the students try to solve the problem in an urban context, they also gain awareness about the cultural heritage.

In addressing the design problem, a comprehensive approach has been taken in considering the interplay between physical architectural solutions, conservation, and urban-scale strategies. This intricate relationship is illustrated in Figure 3, emphasizing the importance of each factor in the context of analysis. Our grading system is meticulously designed to evaluate projects based on their engagement with these various factors, focusing on the effort invested and the richness of content and detail provided. The grading scale is elaborated upon, offering a clear framework for understanding the criteria for evaluating studio outputs. This scale ranges from 1 to 5, with 5 indicating exemplary effort and attention to detail and 1 signifying minimal engagement with the project's core aspects. This approach ensures an assessment of each solution, effectively

acknowledging the complexity of integrating architectural design, conservation principles, and urban planning strategies.

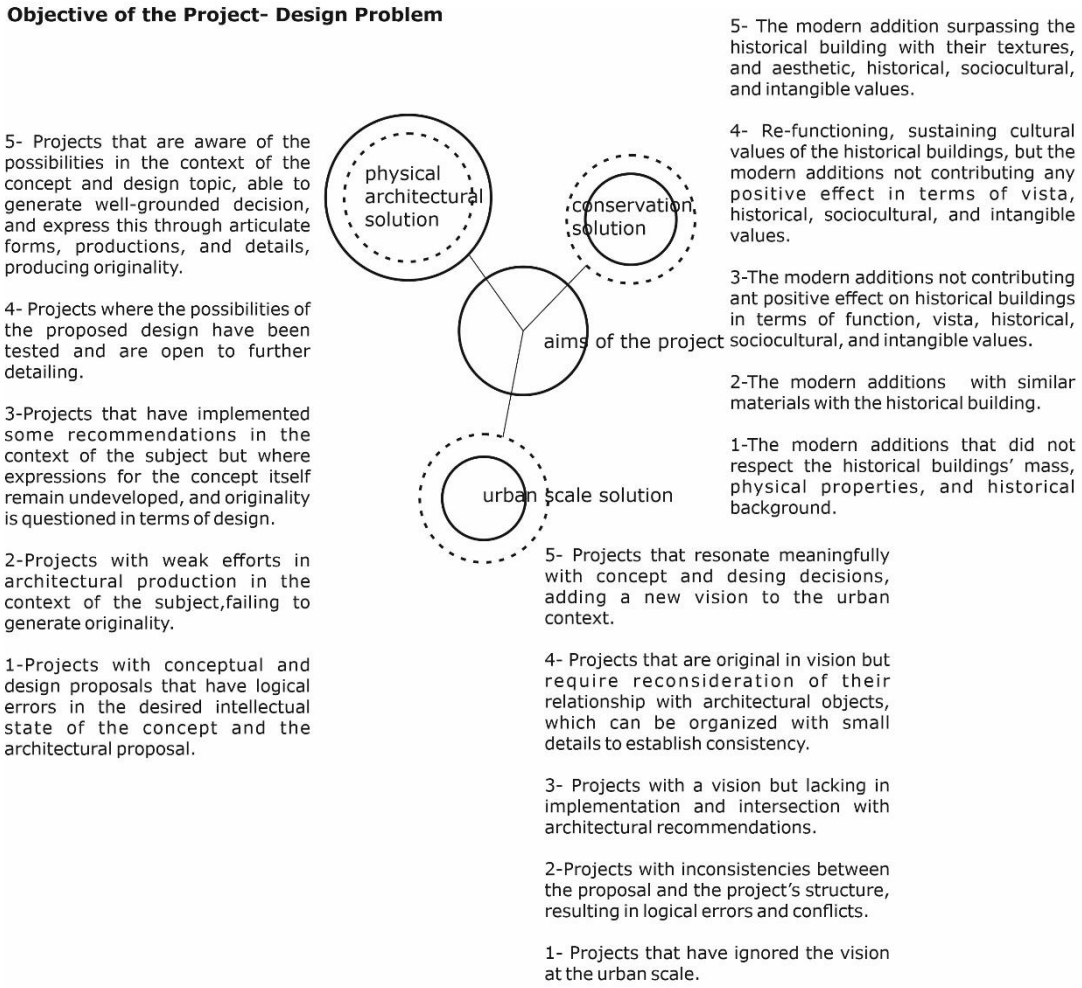
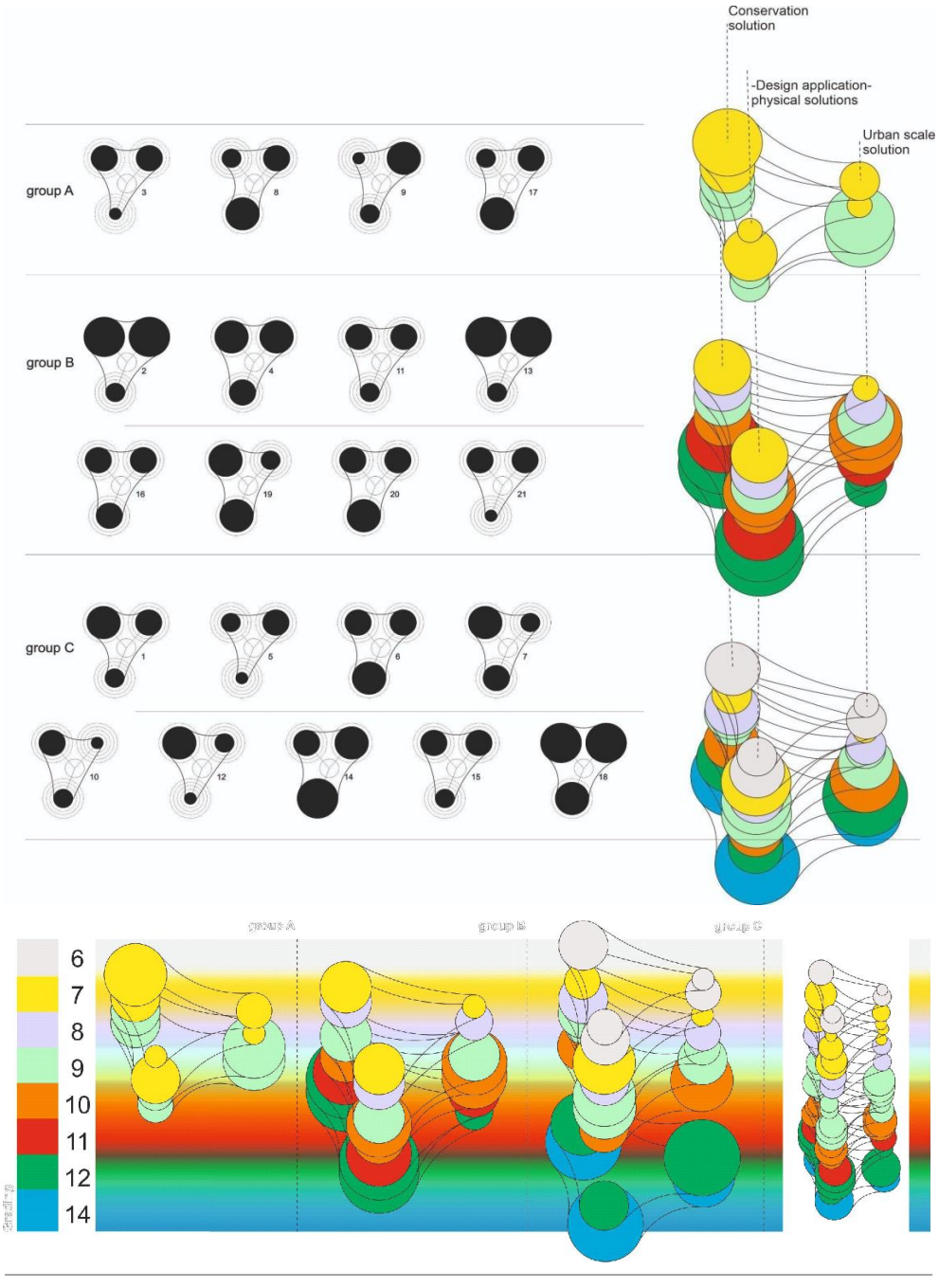


Figure 3. Scale for the titles framing the design problem

The configuration of the graphic representation in Figure 4 is determined by the scores that students receive on the scale used to evaluate their approach to the design problem. There are three study groups: Groups A, B, and C. However, there is an unequal number of students among the groups due to the vertical studio structure, where two separate levels of design studios were performed simultaneously. The individual grades of each student in the groups were acquired autonomously. The spheres display the grades that students received for each factor. The volume of the spheres grows proportionally with the increase in grade. The total score of all students for each factor is displayed at the bottom of the graphic. The graphic representation is subsequently placed in a new context and linked to the studio setting, taking into account aspects such as the instructor's attitude and the conditions of the studio.

When considering a design problem as the development of an architectural solution for the given topic, it is essential to remember once more that architectural problems cannot be technically solved because there are too many interdependent variables (Ballantyne, 2013). This assessment was only developed to assist instructors in evaluating design solutions for grading purposes.



TOTAL	Conservation solution	Physical solutions	Urban solutions
105 points (5x21)	67 pts	69 pts	56 pts

Figure 4. Scales of each project by four instructors based on scaling

Inhabitants of The Design Studio

There are two different inhabitants; the instructors who are the main source of knowledge and the students who are the recipients of this knowledge. How much knowledge can be transferred and grown depends on the inhabitants' cognitive skills, knowledge, professionalism (Uluoğlu, 2000) and also identities (Coia & Taylor, 2009). In architectural education research subjects, students are categorized mostly based on their skill and cognition level, but Boling et al. (2020) look from a broader point of view. Their perspective, shared with

Nelson and Stolterman (as cited in Boling et al., 2020: 1871), view students as a whole, including their character, their social and cultural background. The same perspective is also valid for the instructor. Their teaching style cannot be separated or viewed independently from their identity (Uluoğlu, 2000; Coia & Taylor, 2009: 4-5; Boling et al., 2020), constituted by their cognitive level, education level, specialization, skills, experiences, socio-economic, and cultural background. Thus, each instructor assumes or constructs a role based on their identity (Coia & Taylor, 2009: 6).

The architecture design studio has a problem- and/or project-based learning process (Bridges, 2006), and most of the time, this learning process is taught through one-to-one critiques. Critiques are intellectual exchanges between students and instructors (Uluoğlu, 2000; Goldschmidt et al., 2010; Oh et al., 2013; Khaleghimoghaddam, 2023). During crits, instructors can be perceived as a knowledge source by the students due to their background and specializations, but actually, knowledge exchange is reciprocal/mutual. Also, critiques' subjects may vary from theoretical knowledge to building and/or construction knowledge based on the professional experience and expertise of the instructors (Oh et al., 2013). But it should not be forgotten that instructor-student exchanges are not impersonal (Coia & Taylor, 2009: 6). Since these interactions aim at teaching something, they will embody individual views and approaches to the subject.

This paper focuses on the interaction between students and instructors from the perspective of the instructors. One of the factors that affect the understanding of knowledge is the role of the instructor in this interaction. There are different approaches to the definitions and types of instructor roles (Goldschmidt et al., 2010; Kolb et al., 2014). According to Kolb (2014: 1), there are four different roles that an educator can adopt: "facilitator," "subject expert," "standard-setter/evaluator," and "coach". According to Goldschmidt (2010: 286-287) there are three types of roles assumed by studio instructors. The most frequently encountered type of the three is where the "*instructor as the source of expertise or authority*" where instructors have to transmit their knowledge, and the students are expected to 'extract' it. The second one is "*the instructor as coach or facilitator*" where the instructor has to guide the student to achieve his/her potential. The last one in "*the instructor as* '*buddy*'" where positive reinforcement and encouragement is provided to the student by the instructor. This paper uses Goldschmidt's (2010) classification when explaining the interaction between inhabitants due to being tailored to design studio instructors and not general educators.

Another factor is how an instructor passes his/her knowledge to students. As Goldschmidt (Goldschmidt et al., 2010: 286) states the instructors are practitioners or researchers that have no pedagogical training and rely on their "experience, awareness and talent". Critiques are the major tool used to teach the design process and it is achieved through an interaction between inhabitants (students and instructors) of the design studio. According to Moore (1989: 1) there are multiple interaction models in education which are "*Learner-Content"*, "*Learner-Instructor"* and "*Inter-Learning"*. Types of critiques used within the scope of a design studio allow the use of all these models during different times. Desk-critiques are the pinnacle of the student-instructor interaction, where the learning process is affected by the cognitive and educational level of the student (Moore, 1989: 2) but also their identities (Coia & Taylor, 2009). Varied identities, backgrounds and specialties of instructors can be seen as both an advantage where students are getting feedback from different point of views, or a disadvantage as each instructor will assume a different role because of their individual point of view toward education. While desk critiques are *learner-instructor* interactions, the physical space or the entity called design studio allows ample chances for *inter-learning* interactions providing a space for students to discuss and exchange knowledge. The *learner-content* interactions are mostly inner interactions of the students that process knowledge. These internal interactions can be ignited during panel-critiques whereby listening to another student's review the student can find answers to his problems or create new ones toward the solution of the design problem.

Fourth-year design studio: In this case, within this specific design studio, there were three groups of two-instructors sharing the same space. Each group had around 15 students, but as explained before, since this was a vertical studio, each group had a different number of students from different grades. In group A one instructor's specialization was conservation and the other urban studies, in group B one instructor was also specialized in conservation and the other instructor was a professional architect, and in the last group, group C, one instructor specialized in architectural representation and theory and the other in structure.

To be able to understand ourselves as instructors and to see if our approach was affecting the outcome, interactions affected both by the identities and roles of the instructors and students have been discussed and, at the same time, analyzed during collaborative discussion sessions. In the co/autoethnographic method (Coia & Taylor, 2009) used to analyze interactions, discussion sessions are used as both data gathering and data analyzing moments. Discussions were conducted each week after the course, while the subject changed from week to week based on the performances of the inhabitants. These discussions revealed that each group mostly assumed different roles (Figure 5). As it can be seen in Figure 8, each group had a week or more, where each instructor simultaneously or not assumed the authoritarian role. At the same time these sessions allowed us to see that group instructors were not just assuming one role but switching between roles during the semester.

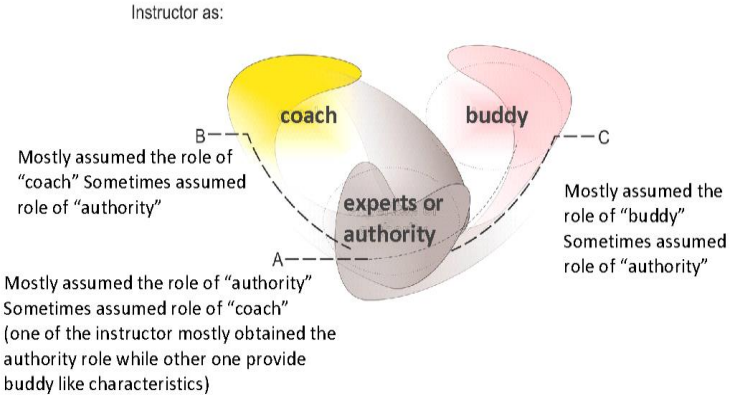


Figure 5. Instructor roles assumed by each groups' instructors

Physical Properties of the Classroom

The studio is regarded as an integrative environment in architectural design education, with scholars emphasizing the importance of its environmental conditions. Park's (2020) work on rethinking design studios highlights this perspective. Furthermore, Ciravoğlu (2014) emphasizes the studio's role as a primary medium for architectural education, facilitating critical dialogue and creative exchange. However, Corazzo (2019) suggests that the traditional concept of the ideal studio, where each student has their own workspace, is considered outdated in contemporary creative education. This shift in perspective underscores the evolving nature of design studio environments and their impact on pedagogy. The studio environment is structured to facilitate a dynamic relationship between inhabitants (Koronis et al., 2021). In this perspective, the studio environment establishes a relationship between functional outcomes, conceptual thinking, and knowledge-based approaches. These three branches converge, enabling the creation of scenarios where the concepts seamlessly dissolve within an appropriate relational context.

Analyzing the physical properties of the classroom is crucial for understanding the interaction between observation and modelling. The studio environment serves as a testament to students' adaptability and the dynamic life within the studio, with each case producing its own models, which are important collaborators in the design process. In many studies, the physical studio environment is observed under conditions of unrestricted use, acknowledging that the boundaries vary (Bagheri & Nouri, 2016; Corazzo, 2019). The quality of the physical environment has a significant impact on creativity. The definition of the physical studio varies, with conventional and contemporary perspectives offering different interpretations. As seen in the other research, also the project site influences the adaptability of the design process and plays an active role within the physical studio construction (Ozorhon & Sarman, 2023; Gaber, 2022). It engages students, boosts their motivation, and captures their interest.

The classroom serves as a crucial foundation supporting the relationship between students and their work. It is an important base for fostering interaction and creativity. Conversely, the virtual studio, which is separate from the physical environment, also plays a significant role. The classroom is integral to education and is often described as a polyphonic environment. The classroom is regarded as a tool that fosters creativity, making it a vital component of the educational process (Ozorhon & Sarman, 2023). In the realm of design, much of the content is inherently challenging to articulate solely through verbal expression. Design studios are best

described as collaborative, materially intensive, and omnipresent work environments, where interaction and physical engagement are central to the creative process (Vyas et al., 2013). Conceptualizing the classroom as a living model within a physical space where the process unfolds over time, incorporating events such as presentations and critiques.

The design studio offers students and instructors a space to create an optimal physical environment, incorporating all necessary components for professional learning and social interaction, utilizing a wide range of resources and methods (Arain et al., 2018). The physical studio is redefined alongside the program in response to the evolving nature of the studio's purpose. Consequently, it is crucial to consider the impact on design and creative processes that arise from field trips and the establishment of collaborative environments during the initial weeks of the studio process. Two distinct types of physical studios can be identified: the temporary, nomadic studios formed during field trips, where collaborative environments are established, and the permanent classroom within the architecture school itself. In this case, it becomes apparent that the studio does not provide opportunities for alternative usage and becomes messy. On the other hand, Till (2009) views mess as a law, considering it an opportunity from a social and institutional perspective.

***Fourth-year design studio**:* In this studio, the constraint of limited space compels us to generate site-specific solutions, and the restrictions of the area naturally give rise to an organic model. As can be seen in Figure 6, there is a recording of the inhabitant studio usage solution. The planimetric drawing shows three zones in the studio environment and a possible chance of meeting among them. The perspective drawing is a reflection from any moment in the studio that is how studio organization is seen in table critique sessions. Two groups' working tables are neat and in similar order, but the blue indicated group is not that tidy and even works in a messy environment according to the other two.

Figure 6. The planimetric and imagery figuration of classroom

In the studio, utilized across various courses, the research concentrates on the dynamics of critiques and the interactions between tutors and students, analyzing these relationships during active studio hours. This operational site serves as a crucial factor for the design. The studio's usage exerts a distinctive and immeasurable impact. In this regard, the research endeavors to articulate this effect through representations of dynamics by changing the position of the table in the studio plan. Below it is indicated by the perspective and plan view. The physical environment is considered as a factor that influences the interactions between inhabitants. Although the working area of inhabitants is quite limited and not impractical for creating different group study areas, having an open planned system promotes communication and unplanned feedback between inhabitants.

DISCUSSION

Below (Figure 7), there is a mapped discussion about the design studio. It indicates three elements and their discussion over the case study. As it is seen that these topics are very integrated with each other and somehow the outcomes affect each other's context.

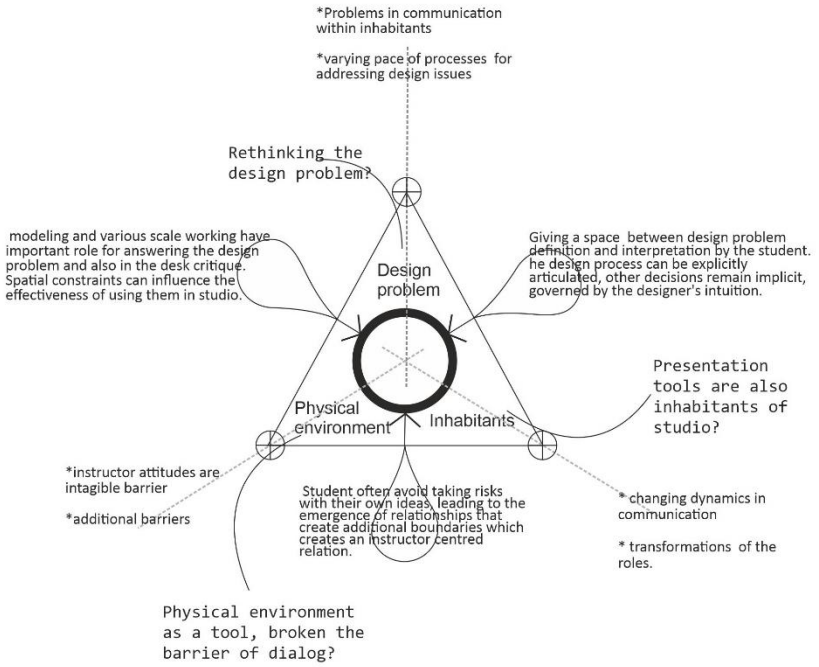


Figure 7. Correlation and mapped discussion of design studio

Design problems typically emphasize the designer's individual creative approach to site engagement. However, given the critical nature of certain sites, which are significant both in terms of historical memory and contemporary architectural politics in Turkey, the design process becomes increasingly complex. This complexity arises from the need to balance the preservation of natural elements with the demands of modern development. This is particularly evident in heritage sites and land in 21st-century İzmir, where the challenge lies in integrating historical preservation with contemporary architectural practices. Working in a historical environment poses both a challenge and a design brief, setting boundaries for the studio.

While the design studio does not aim to restrict the designer's approach to the site, it consistently requires a thorough understanding of concepts, detailed knowledge, and acknowledgment of ideas. The designer's role extends beyond merely identifying forms; they are also a researcher who generates new perspectives on space and place. Consequently, it is crucial to engage with the literature to gain insights into both the historical and future contexts of the relevant area. It is posited that ideas supported by literature or the designer's vision become clearer and more interwoven. Ultimately, the project derives solutions to design challenges from the insights and findings accumulated through its own research process. The learning environment benefits not only from the designer's professional expertise but also from the project site itself-defined as İzmir for this studio. Instructors encourage a close relationship between the building and its environment to foster a rich learning experience for designers. Consequently, the expansion of the learning environment and the exploration of ruins play a crucial role in the aesthetic development of the projects, which are expressed in diverse forms. During the learning process, being influenced by numerous ideas leads the designer to clarify and elaborate on their own design process or to establish evidence to support their arguments. Design problems are experienced as fully activated at each stage within the learning environment. Some solutions are constructible, while others develop serendipitously outside the studio.

It should not be forgotten that while architectural education aims to teach the design process, it also aims to provide students with professional architectural skills. So, there should be a balance created both by the curriculum and the design studio itself. It is believed that diverse instructors offer this balance, allowing students to have a richer knowledge environment. But it should be precise that since the design studio is also a place where there are learning outcomes defined by the curriculum all instructors should be informed and be on the same page about it because harmony in the dialog of inhabitants is very important for creating a fruitful design studio. In this studied case, students sometimes find themselves in a dilemma, and the language employed in studios has become cryptic for both instructors and students. This presents a potential risk for the

design studio process and the evaluation of solutions to design problems. The studio serves as a communal environment that integrates all participants; although the instructor gives importance to student-centered process for design education, according to the studied case, it is often characterized by an instructor-centered or authoritative atmosphere that imposes specific constraints on the workspace. In one hand, while some instructors perpetuate this atmosphere, others attempt to modify it. This study allowed us to understand the richness of differences within a design studio setting.

The design studio environment is enriched by a multifaceted spectrum of inhabitants that have different cognitive skills, knowledge and identities, which reflects on the variety of projects with different approaches. This situation can be considered as advantageous and disadvantageous. The advantage lies in the diversity of the outcomes which consecutively becomes the disadvantage when grading. A solution to the problem of grading arising from this diversity of instructors can be averted by creating a scaling table, created at the beginning of the semester by all instructors, that includes all alternative solutions to the design problem. Design problem titles should be developed collaboratively among all instructors to ensure that critiques are more consistent for students, even in the presence of multiple groups and varying teaching styles. Design as a philosophy should be seen as a skill to be developed. In addition to this result, if studios predominantly emphasize and stem from analytical practices, the pursuit of originality is not seamlessly integrated. This creates a counter-effect on conceptual authenticities. Conceptual resolution, implementation, and scenario development encompass the geometric, symbolic, and semantic dimensions of architectural space production. As a critique of the syllabus, the time allocated for embracing the conceptual phase should be extended.

CONCLUSION

This study suggests that the construction of the syllabus is not solely based on design problems; rather, it should also consider the background of the instructor, which encompasses different histories and relationships with architecture. The distribution of student project grading scales varies according to class groups. If this differentiation is interpreted through 3 factors, average scales are seen when an instructor critiques as a *coach,* while when the instructors act as a buddy, the scales are spread across all ranges. Another reason for the high scales may be that the team uses the physical environment expansively and has high classroom interaction. As for the second question asked within the scope of this paper: yes, there is a difference of outcomes due to the teaching styles of an instructor.

All in all, In the exploration and interpretation of the relationships opened up through the design problem above, two additional factors have been considered: instructor attitudes and environmental relations. Here, it has been observed that projects tend to converge in total scores under a generally authoritative approach. The emergence of authority from the instructor side is noted to become obligatory due to the students' demands as well. Students often expect confirmation or rejection in response to their design approaches. This could be reflected as a factor increasing similarities among projects. The physical environment is regarded as a determinant that impacts the interactions among inhabitants. While the available space for inhabitants to work in is limited, it is not impossible to construct various group study areas. Thus, it is necessary to plan the studio according to the physical properties of the classroom. Critiques should be implemented through one-to-one critiques, and students should be allowed to work with any instructors they want, depending on their expertise.

The chance intersections and debates in the dialogues among inhabitants during in-class activities, determined by the free space's potential for overlapping, prompt reflection on the concept of dialogues. In order to increasing this situation, the classroom organization is rethinking again. When the perspectives of design and the designer align, educational backgrounds and experiences converge to present a unique viewpoint. According to Goodman, this is neither commensurable nor comparable with others (Goodman, 1978). This paper presented how three elements of a design studio affect each other from an interpretative way. For further studies this relationship can be analyzed under qualitative methods that refine the relation between these three elements. From a point of view of conservation, a more specific design problem based on repurposing a heritage building may increase the importance of cultural preservation. Also, a more in-depth study can be conducted to better understand if the expertise of an instructor affects the outcome due to the shared knowledge.

Authors' Contributions

The authors contributed equally to the study.

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Competing Interests

There is no potential conflict of interest.

Ethics Committee Declaration

Ethics committee approval is not required (approval was obtained from the students via a consent form in order to benefit from the projects within the scope of scientific study).

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