...::KENT AKADEMİSİ | URBAN ACADEMY

Volume: 15 Issue: D.Ü. 2. Architecture Symposium Special Issue - 2022 | Cilt: 15: Sayı: D.Ü. 2. Mimarlık Sempozyumu Özel Sayısı - 2022

ARTICLE INFO | MAKALE KÜNYESİ
Research Article | Araştırma Makalesi
Submission Date | Gönderilme Tarihi: 22.10.2021
Admission Date | Kabul Tarihi: 04.03.2022

CITATION INFO | ATIF KÜNYESİ
Kızılyaprak, H. (2022). Oskay, B. A Construction Design Experience in Emergency Distance Education: Detail Patterns, *Kent Akademisi Dergisi*, *15*(Dicle Üniversitesi 2. Uluslararası Mimarlık Sempozyumu Special Issue,):36-52
https://doi.org/10.35674/kent.1013698

A Construction Design Experience in Emergency Distance Education: Detail Patterns

Acil Uzaktan Eğitimde Bir Yapım Tasarımı Deneyimi: Detay Örüntüleri

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Öz

Yapım tasarımında sistematik düşünme özellikle işlev, yapılabilirlik ve görsel etki kavramları arasında neden-sonuç ilişkileri kurmada mimarlık öğrencilerine rehberlik eder. Artan teknolojik gelişmelerin etkisiyle geride kalan "deneme-yanılma" yaklaşımının yerini alan sistematik tasarım ve üretim modeli, mimarlık alanına yapılandırılmış bir yapım tasarımı anlayışını kazandırmıştır. Detaylandırma eylemi, kavramsal tasarımı takip eden ardışık eylemlerin girdi ve çıktılarının açıkça ortaya konduğu sistematik bir organizasyon gerektirir. Literatüre ve eğitim alanındaki uygulamalara yönelik araştırmalar sonucunda yapım tasarımı alanına yönelik sistematik yaklaşımların kısıtlı nicelik ve nitelikte olduğu görülmüştür. Bu sebeple, sistematik düşüncenin eğitimdeki etkilerini araştırmaya yönelik bir alan çalışması hedeflenmiştir. Mimarlık eğitiminde öğrenmeyi destekleyici bir yaklaşım olarak "detay örüntüleri" bu çalışmanın çıkış noktasını oluşturmaktadır. Bu bağlamda, mimari teknolojiye ilgi duyan öğrenciler için planlanan "Yapım Tasarımı" dersi kapsamında, sistematik detaylandırma ve yapı sistemini oluşturan alt sistemlerin bir araya getirilmesine yönelik alternatif yaklaşımlar üzerinde durulmuştur. Sistematik ve bütüncül düşünmeyi yapım tasarımı pratiği içinde yerleşik hale getirebilmek amacıyla Edward Allen'ın "Architectural Detailing: Function, Constructability, Aesthetics" adlı kitabında detaylandırmanın temel ilkelerini içeren "detay örüntüleri" yaklaşımına odaklanılmıştır. Bu çalışmada ele alınan "Yapım Tasarımı" dersi, 2020-2021 Bahar dönemi kapsamında tamamen acil uzaktan eğitim koşullarında yürütülmüştür. Tüm toplantı, tartışma ve sunumlar kullanılan uzaktan eğitim platformunun sınırları dâhilinde dijital formatta yapılmıştır. Dersin strüktürünü geliştirmede ana yöntem olarak "Öğrenme Modülleri Tasarlama" modeli kullanılmıştır. Dersin hedef ve kazanımları belirlenmiş, detay örüntüleri yaklaşımı 14 haftalık ders planına dönüştürülmüştür. Değerlendirme için, öğrenme çıktılarına göre yapısal hizalama yaklaşımı ile hem öğrenci başarı değerlendirmesi hem de ders değerlendirme ölçütleri belirlenmiştir. Değerlendirmeler araştırmacılar tarafından 5'li Likert ölçeği ile puanlanmıştır. Ayrıca değerlendirme sürecinde araştırmacıların sınıf içi gözlemlerinden yararlanılmıştır. Araştırma sonucunda öğrencilerin yapıyı bir bütün olarak değerlendirebilmelerinde, yapım tasarımı alanında bilgi ve beceri geliştirmelerinde, mimari detaylandırma sürecine ilişkin teorik ve pratik bilgileri kullanabilmelerinde, problem çözme ve uygulamada disiplinlerarası düşünebilme ve sistematik yöntemler kullanabilmelerinde olumlu sonuçlar elde edildiği belirlenmiştir.

Anahtar Kelimeler: Mimarlık eğitimi, Yapım tasarımı, Detay örüntüleri, Covid-19, Acil Uzaktan eğitim

ABSTRACT

Systematic thinking in construction design provides guidance for architecture students, especially in establishing cause-effect relationships between the concepts of function, constructability, and visual effect. The act of detailing requires a systematic organization in which the inputs and outputs of the consecutive actions following the conceptual design are clearly revealed. It is observed that systematic

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approaches in the constructiondue to design field are limited in quantity and quality as a consequence of the studies on the literature and applications in the field of education. Therefore, a case study aimed at investigating the effects of systematic thinking construction design education was conducted. The "detail patterns" approach in architectural education constitutes the starting point of this study. In this context, within the scope of the "Construction Design" course planned for students who are interested in architectural technology, alternative approaches to systematic detailing and bringing together the sub-systems that make up the building system were emphasized. For the implication of systematic and holistic thinking in construction design practice, it has been focused on "detail patterns" approach, which includes the basic principles of detailing in Edward Allen's book entitled "Architectural Detailing: Function, Constructability, Aesthetics". The Construction Design course covered in this study was conducted entirely in emergency distance education conditions during the 2020-2021 Spring semester. All meetings, discussions and submissions have been made whitin digital format in the limits of the distance education platform used. The "Designing Modules for Learning" *model was used as the primary method for developing the course the structure . The target and learning outcomes of the course were determined, and the detail patterns approach was transformed into a 14-week lesson plan. For assessment, both student achievement evaluation and course evaluation criteria were determined with the constructional aligning approach according to the learning outcomes. Evaluations were scored by the researchers with a 5-unit Likert scale. It has been determined that positive results have been obtained in the students' ability to assess the building as a whole, to develop knowledge in the field of construction design, to use the theoretical and practical knowledge on architectural detailing process, to solve the problems encountered by using systematic methods and to think interdisciplinary in problem solving and practice.*

Keywords: Architectural Education, Construction Design, Detail Patterns, Covid-19, Emergency Distance Education

INTRODUCTION:

In architectural education, architectural design courses play a central role with the highest number of lecture hours and credits. Other design/creative thinking, history/theory/culture/art, environment/city/society, technology and occupational environment courses such as construction systems and technologies, architectural history and theory, surveying and restoration, urban design and planning, and computer-aided design support the holistic structure of architectural design (Kurt, 2009; Kızılyaprak and Altun, 2019a). Emphasizing the importance of systematic thinking within the holistic structure of architectural design, planning educational processes in line with this thought, and transferring the knowledge and skills according to this type of thinking are among the most critical requirements of architectural education. The reason is that the architectural education, which is an interdisciplinary field, is one of the unique fields where creative skills are needed (Salama, 2005).

Within the architectural education program, building science and construction technology (BSCT) is evaluated under the technology courses. The sub-fields of BSCT consist of "general constructional concepts, construction methods, building materials & detailing, presentation techniques and building sub-systems". Accordingly, building sub-systems include "structural systems, building elements and service systems". This study focuses on the latter which is going to be assessed under the construction design course (Kızılyaprak and Altun, 2019b). The construction design process, which has a crucial role in the transition from thought to practice, also emerges as one of the stages in which systematic thinking gains the most importance. At this point, systematic thinking provides guidance for architecture students, especially in establishing cause-effect relationships between the concepts of function, constructability, and visual effect.

After the first COVID-19 case was announced in Turkey on March 11, 2020 (URL-1) and the World Health Organization declared the pandemic on the same date (URL-2), the measures are taken all over the country brought radical changes in formal education in universities. While the distance education environment has become the new normal, it resulted in physical challenges and weakened the communication between the students who could not come together as a team. On the other hand, while the transition from thought to practice, it also brought some concerns about improving their systematic thinking skills. These conditions make the importance of these prominent issues in architectural education, which is an interdisciplinary field, visible once again and highlight the importance of integrating initiatives to gain these skills into the education process.

Distance education practices, which started based on the correspondence studies with the aid of the increase in rail transportation opportunities in the world at the end of the 19th century, have expanded their influence today with the development of computer technologies after the 1960s and information technologies after the 1980s. Although distance education that have followed similar steps since the establishment of the republic in Turkey have become a part of the mainstream, they were not included in the agenda in applied disciplines such as architecture before the pandemic, except for singular practices (Moore and Kearsley, 2011; Bozkurt 2017; Can and Köroğlu, 2020; Kahraman, 2020).

Emergency distance education has been an educational response against the negative effects of the quarantine measurements which COVID-19 pandemic caused, and it provided a quick and pragmatic attempt in architectural education. The difference from distance education is that it is developed as a response to a crisis or disaster instead of being well-planned (Sezgin, 2021; Hodges et al., 2020). The compulsory conditions led by the covid-19 pandemic and the uncertainties it brings have proposed emergency distance education discourse for the agenda of the departments of architecture at universities. Emergency distance education conditions, which also began to be used in applied courses based on face-to-face interaction between the instructor and the student in the classical formal education process, brought advantages and disadvantages in this context.

Many studies conducted in this process reveal that students and instructors felt uncertain and anxious in the early stages of the transition to emergency distance education in architecture, but while distance education is sufficient and useful in theoretical courses, it caused difficulties in developing unique design, scale perception and model preparation in applied courses (Ersine Masatlıoğlu, 2021; Oktay et al., 2021; Yazıcıoğlu Halu and Kula Say, 2021; Bilsel, 2021; Güley, 2020; Şekerci et al., 2021; Merdim, 2020; URL-3). These experiences of stakeholders and interpretations of the implications have a crucial role to maintain emergency distance education as a learning method and provide its sustainability in near future and further. In this point, it is obvious that to deal with the lack of application it is important to design the course schedule according to systematic approaches. There is no doubt that systematic thinking in detail design would provide guidance for architecture students.

The literature on construction design education continues on the axis of limited titles. Innovative and radical approaches are not frequently encountered in the literature. In addition, it is difficult to experience systematic approaches based on the literature in educational practices (Kızılyaprak, 2020). Therefore, a case study was conducted in order to take a step towards eliminating this deficiency and the effects of systematic approach experience in construction design education were tried to be revealed. In this context, this research, which aims to improve the systematic thinking skills in order to provide a holistic approach to design experience, was conducted within the scope of ARC0621 Construction Design course, which is included in the education plan of İstanbul Kültür University Department of Architecture (English). Within the scope of this course, which is one of the three compulsory elective courses, students who are interested in the field of construction systems and technologies are included as the target audience. Prerequisites for this course; to be successful in Physical Environmental Control 2, which is the fourth semester course, and Architectural Design IV, which is the fifth semester studio course.

The course has three main targets that it aims to convey to students:

- Gathering information and determining criteria by transferring design principles to the physical components of the building,

- Introducing different methods in the design of building elements such as criterion limit values, evaluation, selection, design strategies and problem solving,
- Supporting the use of these methods by students in the design process

It also aims to provide designers with the ability to design building elements to embody and apply architectural thinking within the entire building design process. Therefore, the students will be able to gain a holistic perspective and evaluate each construction design step according to a programmatic pathway and a systematic method in order to combine theory and practice in design experience.

The aim of this study is to design learning modules according to the determined objectives of the course and to provide students who have to conduct individual studies during the pandemic process, to plan appropriate method and module design, to produce unique projects, to provide theoretical and methodological contribution that will provide original value in practice, and to discuss the results of the research by measuring it with the determined techniques.

The starting point of this research, which was conducted in the environment mentioned above, is to construct the "detail patterns" approach as a learning tool in order to enable students to evaluate detail design with a systematic approach in the "Construction Design" course, which is an applied course, and to test the results in a distance education environment. In this context, first of all, the importance of systematic approaches in detail design is discussed and the concept of detail patterns introduced by Edward Allen's work entitled "Architectural Detailing Function, Constructability, Aesthetics", which is the learning tool that shapes the schedule of the course, was explained. Afterwards, the method of the research, the modular structure of the course and the evaluation criteria are given. Finally, the outputs of the research will be evaluated and discussed.

1. Systematic Approaches in Detail Design

The changing circumstances in daily life, demands and requirements with industrialization during and after the World War I caused a great increase in the speed of technological developments. Accordingly, this situation also necessitated leaving behind the "trial and error" model, which is one of the oldest forms of production. Since there was limited time for such a production, and as a consequence of this fact, the systematic design and production methods that emerged primarily in non-architectural areas later affected the field of architecture as well. Therefore, this effect has allowed the development of holistic and structural design models.

As Peter Rich and Yvonne Dean (1999) emphasized, detailing in architectural design is more than just the repetition of standard details. That process is a continuous program, which aims optimum use of limited resources and maximum benefit for customers and users (Rich and Dean, 1999).

According to Stephen Emmitt et al. (2009), the architectural design action is not a sequential process that starts with conceptual design, then continues with the detailing process, then the specifications are worked on and finally the construction process are done. Rather, it is a repetitive process in which abstract concepts are continually improved, approved, and frequently developed to produce a sequence of information from which a building can be built (Emmitt et al., 2009).

Edward Allen (1993), with a similar point of view, indicates that detailing is not a linear and completely logical process. It is messy and complex as any other design processes are. It may include negative starts, wrong turns, mental blocks, dead ends, flashbacks, and moments of despair, as well as emotions and steps such as efficient progress, smart decisions, creative synthesis and inspiration, insight, and the satisfaction that comes in moments of finishing. However, contrary to the complexity

of the design process and the blurriness of its steps, the design of the details of a building is a process that significantly finalizes both the technical tools of its construction and its interior and exterior view (Allen, 1993).

The design of a building's details must begin while its form and volume are still fluid. Thus, the materials selected, the processes by which these materials are put together, and the evolving character of the details can influence the formal process of the building as a whole. It is a mistake for a designer to think about how to make a building design after completing it, and buildings designed in this way often look like weak, unsatisfying scenes. In every unique building, old or contemporary, the materials used, and the design and application processes of these materials should be considered as an integral part of the visual effect (Allen, 1993).

2. "Detail Patterns" as a Learning Support Tool

Different approaches on bringing the sub-systems that make up the building system together were primarily emphasized with the students who are interested in structural design within the scope of the course, which determined the scope of the study. Accordingly, "detail patterns", one of the most important of these approaches, which contain the basic principles that Edward Allen defined was focused on. The Architectural Detailing Method is a systematic "point (joint) detail" development approach that Allen (1993) introduced in his work. This detailing model consists of two main parts:

- "Detail patterns" discussed over the concepts of functionality, constructability and aesthetic,
- "Systematic detailing" based on detail patterns.

The detail patterns approach, adopted in this study as a supportive learning tool, is primarily discussed under three sub-headings: Functionality, constructability, and aesthetics (Figure 1).

Functionality	Constructability	Aesthetic
Controlling water leakage	Ease of assembly	Contributive details
Controlling Air Leakage,		
Controlling Heat Flow		
Controlling Water Vapor	Forgiving details	Intensification and ornamentation
Controlling Sound		
Accommodating Movement		
Providing Structural Support	Efficient use of construction resources	Formal transitions
Providing Passages for Mechanical and Electrical Services		
Health and Safety		
Providing for the Aging of the Building		

Figure 1. Detail pattern approach. (Source: Allen, 1993)

As summarized above, detail patterns for different functions are presented in Allen's book mentioned above. Each detail pattern offers specific solutions for different joint details. Designers using this method may present different solution alternatives by adapting the detail patterns which are appropriate for the requirements of the design problem they focus on and decisions on their design (Figure 2).

In addition to the introduction of the modules above, the data synthesis of the model and evaluating the building as a whole by deepening the knowledge and transforming the theoretical knowledge to practice with an interdisciplinary perspective and using the research methods to solve the problems with the appropriate building elements are targeted. In this context, the schedule of the course was structured in 10 functionality approach modules which also contained the constructability and aesthetic approaches mentioned above.

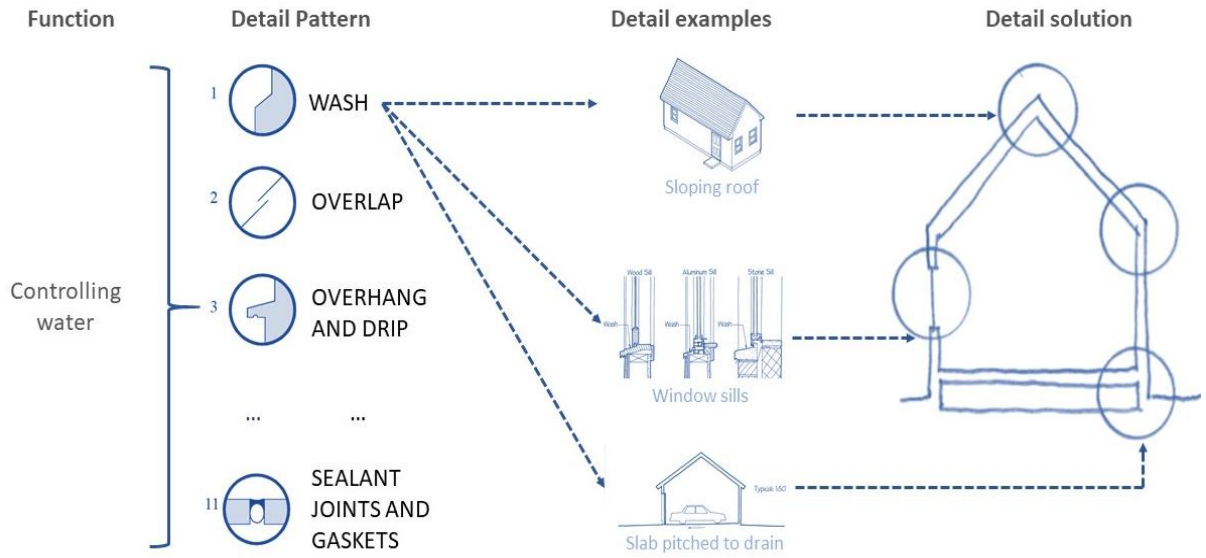

Figure 2. Adaptation process of the detail patterns.

3. Method

This section was structured in two steps. First, the research design and data collection methods of the study were explained, afterwards, the method used in the design of the course, which constitutes the scope of the study, was explained in detail.

3.1. Research Design Method

In this qualitative study, a case study research design was used over a focus group. Observations and design outputs made by the researcher during the period were used as the data collection tools of the research. Accordingly, an ‘have your say’ event was organized with the focus group to standardize the observations as well as the empirical evaluation in order to test the success outcomes targeted in the research.

In transforming Edward Allen's "Detail Patterns" approach into an educational support tool and in designing the course process, the “Designing Modules for Learning” Model (Donnelly and Fitzmaurice, 2005) was used from the instructional design literature since it is compatible with the structure of the research. The results were evaluated with the constructional aligning approach (Biggs, 2003; Utaberta and Hassanpour, 2012) in line with the learning outcomes of the course. Evaluations were scored by the researcher with a 5-unit Likert scale.

3.2. Course Design Method

In this study, as can be seen in Figure 3, the Construction Design course was designed in six steps. It is possible to exhibit these steps as determination of the aims and the objectives, determination of the learning outcomes, determination the learning theory and teaching strategies, determination of the content, determination of the assessment strategies and determination of the evaluation strategy.

The design of the course started with the determination of the aims and objectives. The course has three main targets. First, it intends to convey ability on gathering information and determining criteria by transferring design principles to the physical components of the building. Secondly it aims to introduce different methods in the design of building elements such as criterion limit values, evaluation, selection, design strategies and problem solving. Finally, it supports the use of these methods by students in the design process. It also aims to provide designers with the ability to design building elements to embody and apply architectural thinking within the entire building design process.

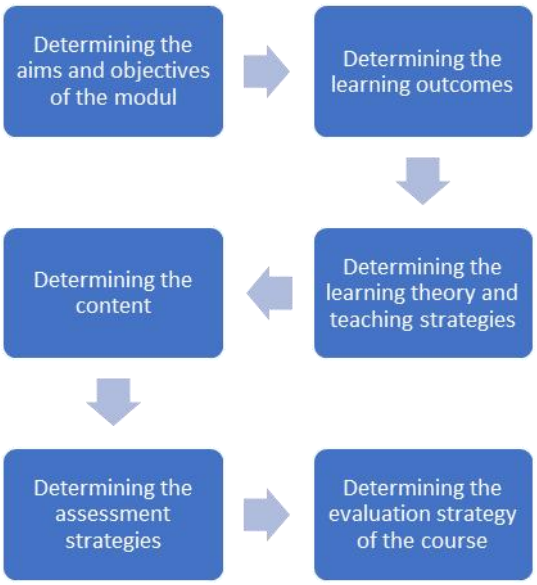

Figure 3. Designing process of the course.

Regarding the structure of the model design approach, second stage of the process is determining the learning outcomes. Five learning outcomes (LO) were determined in line with the aims and objectives of the course:

LO1: Ability to synthesis the data of architectural technology lessons and deal with the whole structure.

LO2: Ability to develop and deepen the knowledge in the field of building elements.

LO:3 Ability to use the theoretical and practical knowledge acquired in the field of building elements.

LO4: Ability to solve the problems encountered in the field of building elements using research methods.

LO5: Competence to use the knowledge, problem solving and/or application skills they have absorbed in the field of building elements in interdisciplinary studies.

After determining the learning outcomes of the course, focused learning theory and suitable teaching strategies that will make these learning outcomes possible should be determined. Learning by doing (Dewey, 1938), which is one of the most suitable learning theories for architectural design education, was also found suitable for the construction design course. However, workshops, project discussions and student presentations were chosen as teaching strategies to support the theory.

For the fourth step, the content of the course and the fourteen-week syllabus were studied. A "student center" topic was chosen in order to work on the desired goals through a small-scale and limited complexity design problem. In addition to this, the book "Architectural Detailing", which is one of the most important books in the literature, was focused on as a source in presenting the knowledge and

skills for the systematic thinking approach in structural design. It was aimed to transform the theoretical knowledge acquired with the support of the book into a skill through practical work.

Table 1. Table of assessment criteria associated with learning outcomes

		ASSESSMENT CRITERIA (AC)			
		AC1	**AC2**	**AC3**	**AC4**
LEARNING OUTCOMES	**LO1**	X			X
	LO2		X		
	LO3		X		
	LO4		X	X	
	LO5	X			X

On the fifth step of the research, as assessment strategy of the course, the constructive aligning approach was chosen. In this approach, four main assessment criteria (AC) was determined aligning with the learning outcomes of the course (Table 1). It was also decided to use the same approach for the evaluation of the course. Thus, it was assumed that it would be possible to determine how successful the course was in achieving the goals. According to these categorizations of the assessment, the studio outputs (student presentations, the construction design of the student hub and detail pattern approach on these designs) were scored by the lecturer (researcher 1) and an observer researcher (researcher 2) based on the Likert scale in Figure 4. The assessment criteria (AC) can be seen below in detail:

AC1: Structural System Design (Success level of the structural system suggestions – it should be compatible with the material and technology selection)

AC2: Student Presentations on Detail Patterns (Success level of systematic analyses of the detail pattern approach and transformation it into a usable form in detail design)

AC3: Application of Detail Patterns to the Entire Project (Success level of association of the detail patterns to the detail)

AC4: Service System Solutions & System Integration (Success level of the service system suggestions and integration with each other)

Figure 4. Likert scale used in assessment.

4. Construction Design Course

The Construction Design course has been held in 2020-2021 Spring Semester, in İstanbul Kültür University, Department of Architecture. Construction Design course is an elective course, which has seven credits and has been conducted for 4 hours per week. The course was chosen by students who have successfully completed Architectural Design 5 and Physical Environmental Control 2 courses and conducted online. The experiment group consists of six students who chose the course in 2020-2021 Spring semester.

Before the pandemic, the course was conducted in a similar context but with a different method. In both approaches, it is aimed to integrate the architectural technology courses (structural systems, physical environmental control, building science and materials) included in the learning plan and expected to be completed before this compulsory elective course, within the scope of an architectural project. While the way it was conducted before the pandemic was mostly focused on service systems and it was mainly built on each single detail and its adaptation variations on projects. Therefore, it caused students to digress from the holistic design approach and focus on investigating the individual details as a main theme. However, this study focused on systematic detail solutions, which allows detail and holistic design decisions together. Table 2 is presenting the weekly schedule conducted during the semester.

Table 2. Weekly schedule of Construction Design course

Weekly Schedule of Construction Design Course	
Weeks	**Content**
1	Introduction to the course. Aim, content, and method. Giving information about the course and determining the projects which will be worked during the semester. WORKSHOP: medium-sized design for student clubs – Preliminary design
2	PROJECT DESIGN: medium-sized design for student clubs – Detailed design Presentation on different design approaches of building elements Introduction of the book / method that will be used during semester. Distribution of the presentation topics – detail patterns.
3	Student Presentations: Function 1 - Controlling water leakage, Studio Work: Project improvements regarding the detail pattern.
4	Student Presentations: Function 2 - Controlling air leakage Studio Work: Project improvements regarding the detail pattern.
5	Student Presentations: Function 3 - Controlling heat flow Studio Work: Project improvements regarding the detail pattern.
6	Student Presentations: Function 4 - Controlling water vapor Studio Work: Project improvements regarding the detail pattern.
7	Student Presentations: Function 5 - Controlling sound Studio Work: Project improvements regarding the detail pattern.
8	Student Presentations: Function 6 - Accommodating movement, Function 7 - providing structural support Studio Work: Project improvements regarding the detail pattern.
9	Student Presentations: Function 8 - Providing passages for mechanical and electrical services Studio Work: Project improvements regarding the detail pattern.
10	Student Presentations: Function 9 - Health and safety Studio Work: Project improvements regarding the detail pattern.
11	Student Presentations: Function 10 - Providing for the aging of the building Studio Work: Project improvements regarding the detail pattern.
12	SUBMISSION: Project improvements regarding the detail patterns

13	Service system solutions and integrations
14	Service system solutions and integrations

The course is designed to systematically complete the constructional design process through a small-scale design problem to preserve the holistic structure of architecture. For this purpose, as it can be seen in Figure 5, the course has been conducted in five main sections, which are preliminary design of the project, structural system design, detail design, service system design and system integration.

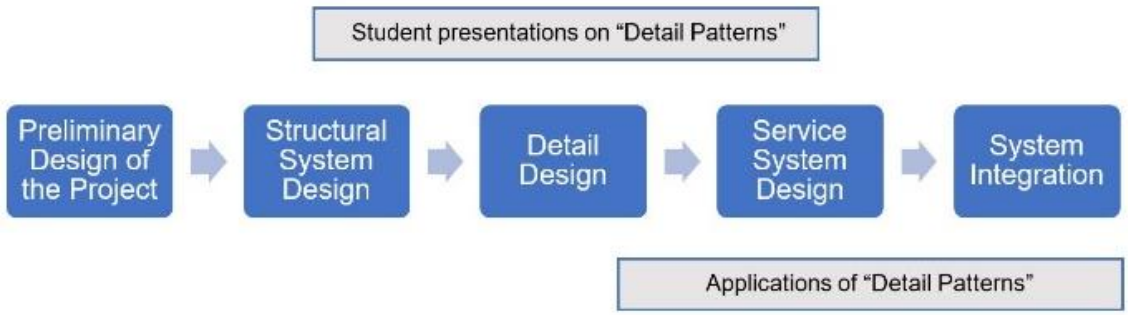

Figure 5. The structure of the course.

During the semester, it has been expected from students to propose design solutions for all sub-systems (space, structural system, service systems and building element systems) and to integrate them successfully with the systematical way. The choice of material and construction methods and technology is left to the student.

In this context, first of all, a workshop was organized, and a preliminary design of a student hub was expected from the students. The project site was the backyard of the school (Figure 6). Since the pandemic conditions are quite restrictive in terms of human movements, this area, which all students are familiar with, was chosen as the project site.

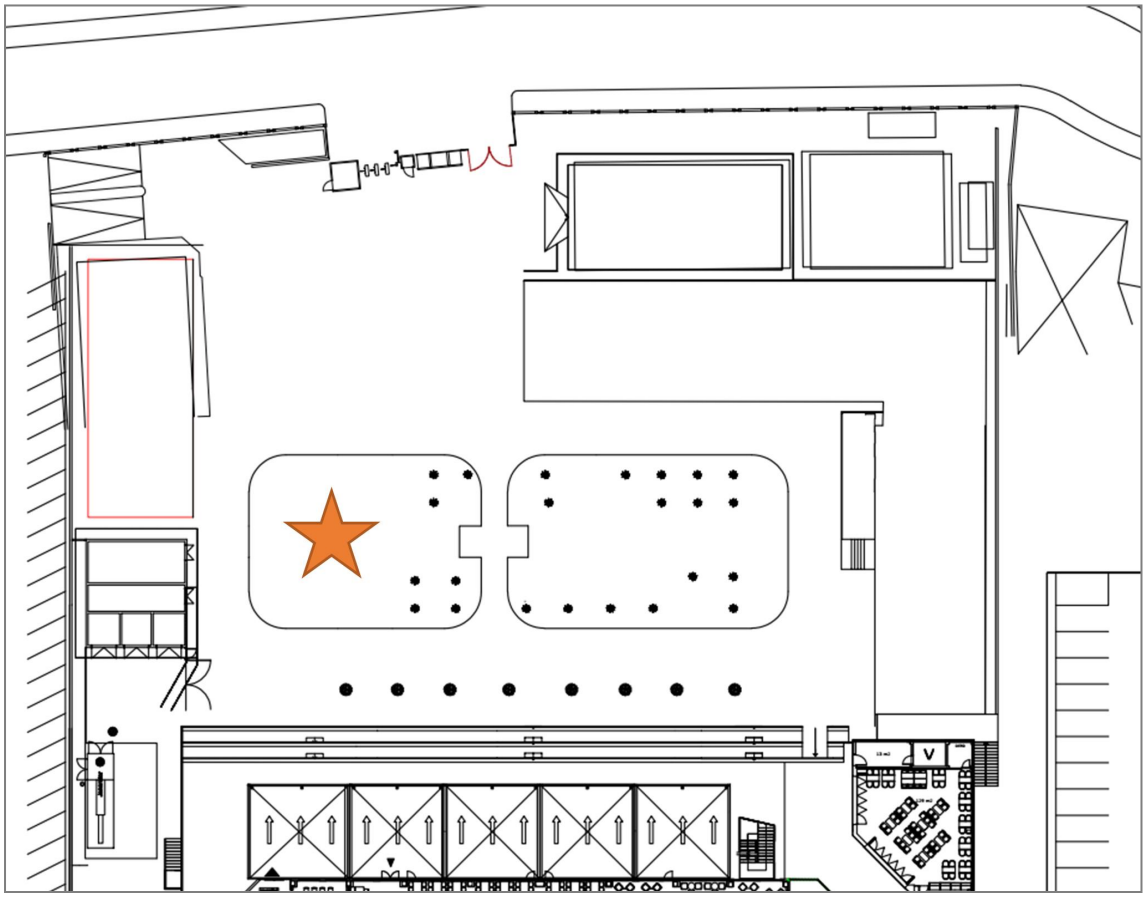

Figure 6. Project site: Backyard of İstanbul Kültür University Ataköy Campus.

The dimensions of the project are limited to 20-25 m2 area, the number of floors to be 1 (if you will use the roof top with a function) or 2 (if you will not use the roof top with a function) and the floor height to be 3 m. In addition to this floor height, students were expected to calculate extra heights for service systems.

The program of the project has been determined as follows:

- 1 WC (unisex)
- 1 kitchenette (1 small sink, coffee / tea related surface, microwave oven, small sized fridge, etc.)
- Study surfaces / spaces
- Social Spaces (inside / outside)
- Meeting surfaces / spaces

After the preliminary design was completed, suggestions for the structural system solutions of the projects were developed and final designs were completed.

Afterwards, Edward Allen's “detail patterns”, which is the focused detailing approach was introduced by emphasizing the importance of systematic thinking in the architectural detailing process and the main topics were shared among the students. In the following weeks, each student made presentations on the main principles of their own subject and the detail patterns that support them during the 10-moduled schedule. At the end of each presentation, projects were developed by discussing the integration of these patterns into their projects.

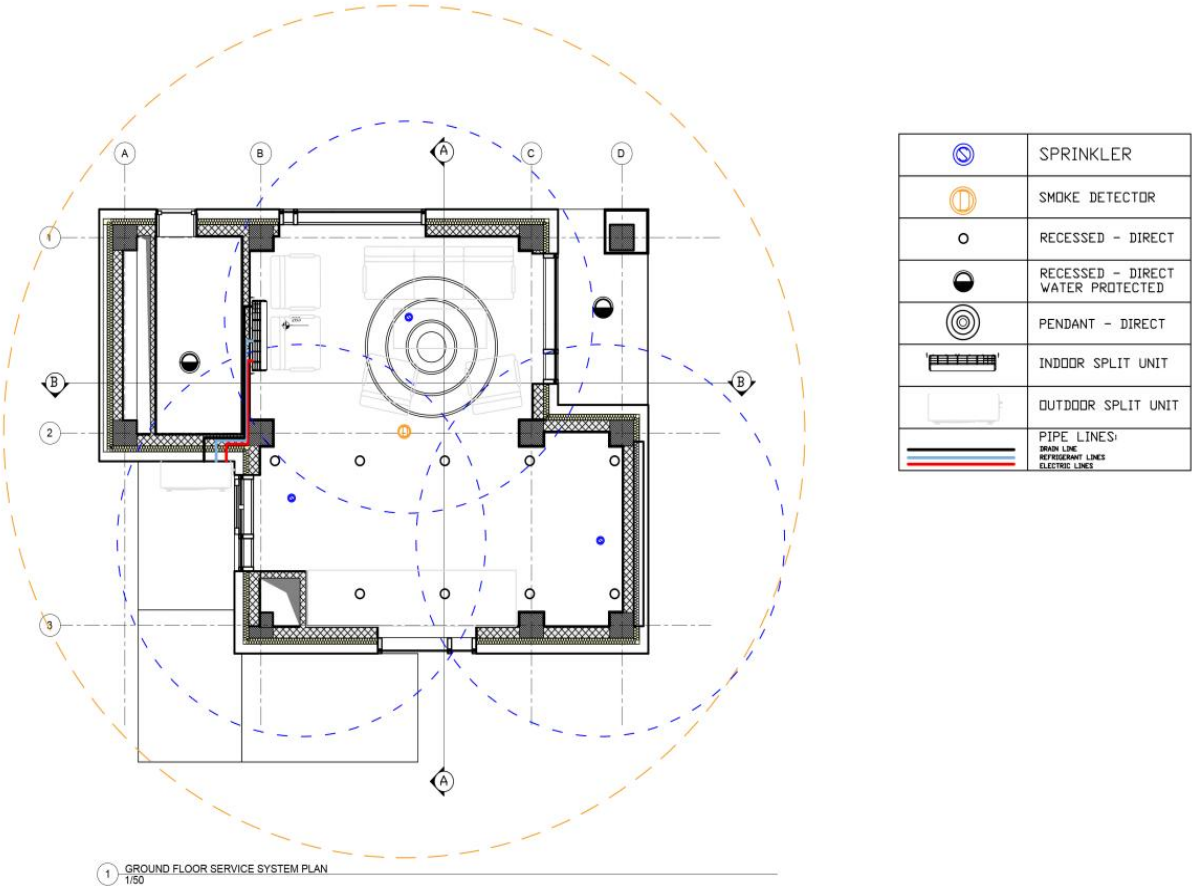

Figure 7. An example for service system solutions for buildings' heating - Cooling, lighting, and fire protection systems.

After completing the presentations and reaching a certain level of maturity in detail design, the students were asked to focus on the service systems of the buildings they had designed. In this sense, they were expected to conduct research and propose solutions for the building's heating - cooling, lighting, and fire protection systems (Figure 7).

At the end of this whole process, a checklist was prepared within the scope of detail patterns and presented to the students, and they were expected to check, evaluate and complete their deficiencies within this scope.

For instance, as it can be seen in Table 3, the checklists provide the details of three “point details” (detail 1: ground floor - exterior wall joint; detail 2: exterior wall - window / door joint; detail 3: exterior wall - roof joint) separately for each function.

Table 3. A Check list example for controlling water leakage function.

Controlling Water Leakage		**DETAIL 1**		**DETAIL 2**		**DETAIL 3**	
		GROUND FLOOR	**EXTERNAL WALL**	**EXTERNAL WALL**	**WINDOW / DOOR**	**EXTERNAL WALL**	**ROOF**
1	WASH	✓		✓	✓		✓

2 	OVERLAP						✓
3 	OVERHANG AND DRIP			✓	✓		
4 	DRAIN AND WEEP		✓	✓		✓	
5 	COLD ROOF						
6 	FOUNDATION DRAINAGE						
7 	CAPILLARY BREAK			✓		✓	
8 	LABYRINTH			✓		✓	
9 	RAINSCREEN ASSEMBLY			✓		✓	
10 	UPSTAND						
11 	SEALANT JOINTS AND GASKETS		✓	✓			

Simultaneously with the use of the checklists by the students, they were asked to mark these detail patterns on the detail drawings they had developed and to present them with cause-effect relationships in the classroom (Figure 8). In this sense, the students not only checked whether their details were in a way that would answer all these ten functions, but also benefited from the detail patterns and solution examples for each function. Markings were made with the symbol and description of the detail pattern.

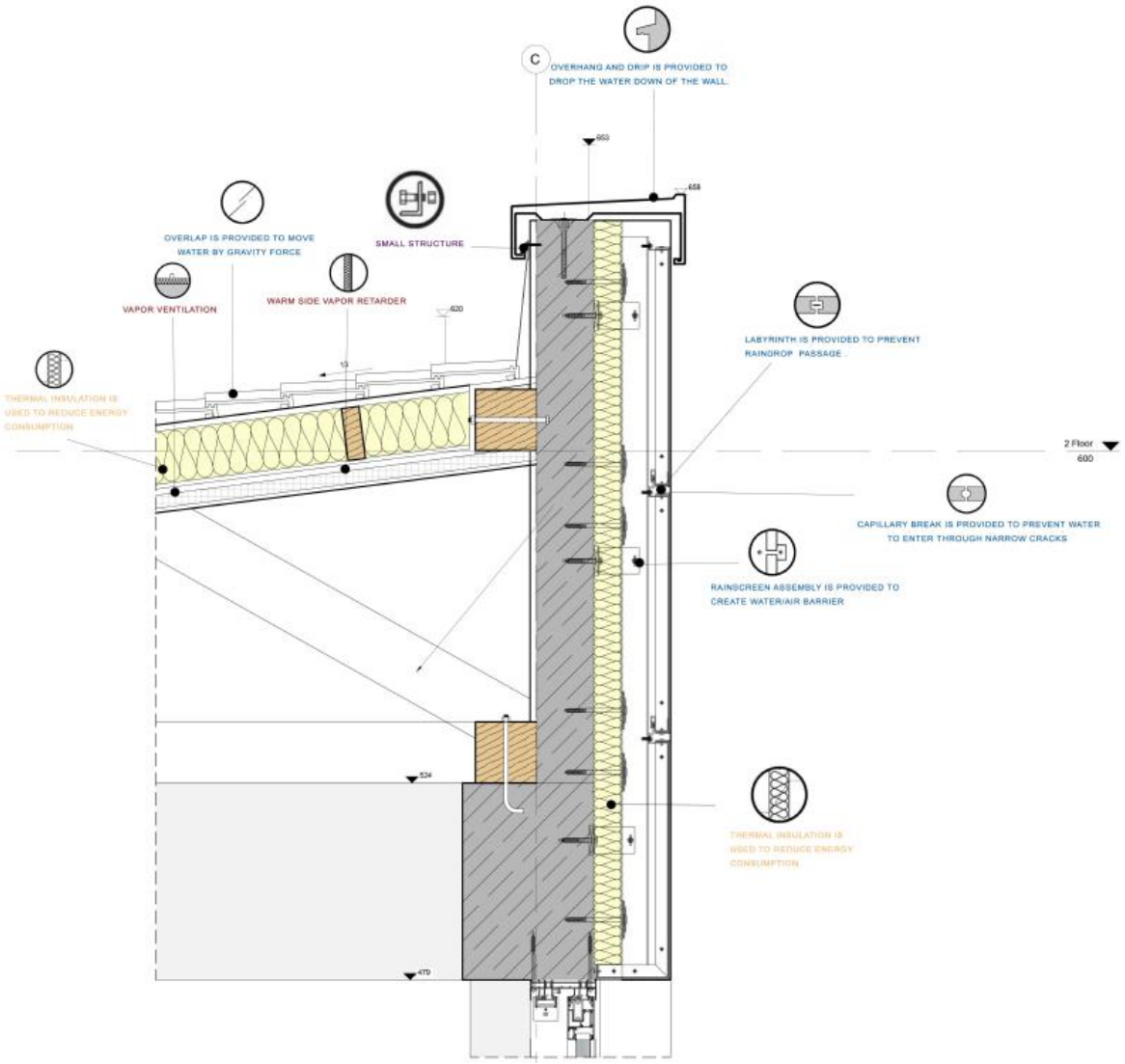

Figure 8. An example for detail design with detail patterns (Detail 3: Exterior wall - roof joint).

RESULTS:

Evaluation of course outcomes was made according to identified criteria. These criteria have been determined in accordance with the learning outcomes of the course due to the structural aligning method (Table 1).

It is possible to see the evaluations made by the lecturer and an observer researcher on the basis of each participant and as average values in Table 4. Considering the averages of the evaluations, the projects yielded “in-between average and successful” results in terms of structural system design (AC1). Student presentations were used to measure the level of systematic analysis of detail patterns and their transformation into usable design tools (AC2). In the evaluations made, students were evaluated as "very successful" in this criterion. The outputs were also evaluated as "in-between average and successful" in the evaluations for the criterion of applying the detail patterns to the whole project (AC3). Finally, in the evaluations made according to the service systems solutions and integration of all subsystems (AC4) criteria, the project outputs were evaluated as "in-between successful and very successful" on average.

Table 4. Assessment of course outcomes.

	AC1	AC2	AC3	AC4	Average
STUDENT 1	0	4	4	3	2,8
STUDENT 2	4	4	4	4	4
STUDENT 3	4	5	4	5	4,5
STUDENT 4	4	5	4	4	4,3
STUDENT 5	4	5	4	5	4,5
STUDENT 6	3	5	0	5	3,3
Average	3,2	4,7	3,3	4,3	

In the "have your say" event conducted with the students in line with the same criteria, they stated that the systematic design perspective was a different method for them. Despite this difference, they stated that the theoretical principles and sample detail solutions presented with detail patterns are a very useful resource in the limited conditions we are in. On the other hand, they specified that in addition to being a resource, the opportunity to evaluate their projects with the checklist created is very beneficial for the development of their projects.

CONCLUSION:

In conclusion, it was observed that the systematic detail design and evaluation approach used showed positive results in students' success and interest in the course regarding the two-stage evaluation made by the lecturer and an observer researcher. The perspective presented was determined as a guiding resource for students in the limited environment of emergency distance education caused by the effects of COVID-19 pandemic in the education field. Thus, the detail pattern approach has contributed to students' ability to assess the building as a whole, to develop knowledge in the field of construction design, to use the theoretical and practical knowledge on the architectural detailing process, to solve the problems encountered by using systematic methods, and to think interdisciplinary in problem solving and practice.

The results reveal that the approach used for the course has a strong potential to be developed and used for the future processes in education. It is indicated that the approach used within the scope of this study can also be used in face-to-face education, although it has been conducted in the emergency distance education process. For further studies, the reliability of the results can increase if the size of the sample group is enlarged and the studio outputs are subjected to an interdisciplinary evaluation.

Compliance with Ethical Standard

Conflict of Interests: The authors declare that for this article they have no actual, potential or perceived conflict of interests.

Ethics Committee Approval: Ethics committee approval is not required for this study**.**

REFERENCES:

Allen, E. (1993). *Architectural detailing: Function, Constructibility, aesthetics*. John Wiley & Sons.

Biggs, J. (2003). *Aligning Teaching and Assessing to Course Objectives. Teaching and Learning in Higher Education: New Trends and Innovations*. University of Aveiro, 13-17 April, 2003.

Bilsel, F. C. (2021). Uzaktan Mimarlık eğitimi: Küresel salgın döneminde ODTÜ Mimarlık Bölümü deneyimi ve sonrası üzerine. *Mimarist 21*(70), 75-80.

Bozkurt, A. (2017). Türkiye'de uzaktan eğitimin dünü, bugünü ve yarını. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi 3*(2), 85-124.

Can. N. & Köroğlu, Y. (2020). Covıd-19 döneminde yaygınlaşan uzaktan eğitimin değerlendirilmesi ve eğitim emekçileri açısından incelenmesi. *Madde Diyalektik ve Toplum 3*(4), 370-380.

Dewey, J. (1938). *Experience and Education*. New York: Collier Books.

Donnelly, R. & Fitzmaurice, M. (2005) Designing Modules for Learning. In G. O'Neill, S. Moore & B. McMullin(eds.) *Emerging issues in the practice of University Learning and Teaching*. Dublin, All Ireland Society for Higher Education (AISHE).

Emmitt, S., Olie, J. & Schimid, P. (2009). *Principles of architectural detailing.* John Wiley & Sons.

Ersine Masatlıoğlu, C. S. (2021). "Ortam" nasıl? Stüdyo kültürü bağlamında mimari tasarım eğitimi üzerine bir değerlendirme. *Mimarist 21*(70), 56-59.

Güley, K. (2020). Covid 19- Çevrimiçi eğitim ve mimarlık. *Arkitera*. https://www.arkitera.com/gorus/covid-19-cevirimici-egitim-ve-mimarlik/ (Accessed on May 26th, 2021).

Hodges, C., Moore, S., Lockee, B., Trust, T. & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause*. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning (Accessed on November 30th, 2021).

Kahraman, M. E. (2020). COVID-19 Salgınının uygulamalı derslere etkisi ve bu derslerin uzaktan eğitimle yürütülmesi: Temel Tasarım dersi örneği. *İMÜ Sanat Tasarım ve Mimarlık Fakültesi Dergisi 6*(1), 44-56.

Kızılyaprak, H. N. & Altun, M. C. (2019a). An analysis of architectural technology education in Turkey. *Mimarlık ve Yaşam, 4*(1), 39-53.

Kızılyaprak, H. N. & Altun, M. C. (2019b). An analysis of the content of building technolgy education in Turkey regarding to Bloom's taxonomy. *Journal of Current Researches on Social Sciences, 9*(2), 57-70.

Kızılyaprak, H. N. & Altun, M. C. (2020). Mimarlıkta yapı ve yapım teknolojileri (MYYT) eğitimine yönelik bir yaklaşım ve eğitim materyali önerisi: Detayın üretici dönüşümsel dilbilgisi. Doctoral thesis, Istanbul Technical University.

Kurt, S. (2009). An analytic study on the traditional studio environments and the use of the constructivist studio in the architectural design education. *Procedia-Social and Behavioral Sciences 1*(1), 401-408.

Merdim, E. (2020). Uzaktan eğitim: Akademisyen 01. *Arkitera*. https://www.arkitera.com/haber/uzaktan-egitim-01/ (Accessed May 26th, 2021).

Moore, M. G., & Kearsley, G. (2011). *Distance education: A systems view of online learning*. (3rd ed.). Wadsworth Cengage Learning.

Oktay H. E., Mutlu Danacı, H., Unvan M., Kavas K. R. & Bakır İ. (2021). Mimarlık eğitiminde sanal eğitim denemeleri ve değerlendirme süreci. *Eğitimde Nitel Araştırmalar Dergisi 25*, 311-324.

Rich, P. & Dean, Y. (1999). *Principles of element design*. Butterworth-Heinmann.

Salama, A. (2005). *New trends in architectural education: Designing the design studio*. Arti-arch.

Sezan, S. (2021). Acil uzaktan eğitim sürecinin analizi. *Anadolu Üniversitesi Sosyal Bilimler Dergisi, 21*(1), 273-296.

Şekerci, Y., Mutlu Danacı, H. & Kaynakcı Elinç, Z. (2021). Uzaktan eğitimin uygulamalı derslerde sürdürülebilirliği: Mimarlık bölümleri örneği. *Mehmet Akif Ersoy Üniversitesi Fen Bilimleri Enstitüsü Dergisi 12*(1), 54-68.

Utaberta, N. & Hassanpour, B. (2012). Aligning assessment with learning outcomes. *Procedia - Social and Behavioral Sciences 60,* 228-235).

Yazıcıoğlu Halu, Z. & Kula Say, S. (2021). Pandemi sürecinin öğrettikleri ile mimarlık eğitimine yeni yollar açılabilir mi? Veya uzaktan mimarlık eğitimi sadece dijital ortamda mı olur?. *Mimarist 21*(70), 60-67.

URL-1. https://www.bbc.com/turkce/haberler-turkiye-51828267 (Accessed on April 23rd, 2021).

URL-2. https://www.bbc.com/news/world-51839944 (Accessed on April 23rd, 2021).

URL-3. https://farc.emu.edu.tr/en/distance-education (Accessed on April 23rd, 2021).