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ONLINE LEARNING IN ARCHITECTURAL DESIGN EDUCATION: STUDENT PERSPECTIVES AT TED UNIVERSITY

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ONLINE LEARNING IN ARCHITECTURAL DESIGN EDUCATION: STUDENT PERSPECTIVES AT TED UNIVERSITY

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Zeynep Kozoğlu

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ABSTRACT

ONLINE LEARNING IN ARCHITECTURAL DESIGN EDUCATION: STUDENT PERSPECTIVES AT TED UNIVERSITY

ZEYNEP KOZOĞLU

Master of Architecture, Architectural Design

Supervisor: Asst. Prof. Dr. Onur Yüncü

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This thesis explores the current state of the studio environment in architectural education and its evolution since its origins. The main aim is to provide an understanding of the effects of studio processes on creativity, collaborative learning, and originality in students' work. Departing from an overview of its origins in the Beaux-Arts and Bauhaus, and tracing major transformations in architectural pedagogy to the present, the thesis focuses on a short period of online learning during the COVID-19 pandemic in relation to the historical evolution of the design studio in architectural education. By concentrating on a particular educational context and a period, the processes and outcomes of student works between 2020 and 2021 in the TED University Department of Architecture will be examined in terms of the impact of the studio environment. This research will be based on the evaluation of collaboration, communication between peers and the tutors, research and production processes of the outcomes, and diversity among the students' works. This thesis is an attempt to situate online learning in architectural design studios during the COVID-19 pandemic within the larger context of design studio traditions to provide an understanding of the effects of spatial change on student works and the design process.

Keywords: architectural pedagogy, studio environment, COVID-19 pandemic

ÖZET

MİMARİ TASARIM EĞİTİMİNDE ÇEVRİMİÇİ ÖĞRENME: TED ÜNİVERSİTESİ'NDEKİ ÖĞRENCİ ALGILARI

Zeynep Kozoğlu

Yüksek Lisans, Mimari Tasarım

Tez Yöneticisi: Dr. Öğr. Üyesi Onur Yüncü

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Bu tez, mimarlık eğitiminde stüdyo ortamını ve zaman içerisinde geçirdiği dönüşümleri incelemektedir. Çalışmanın temel amacı, tasarım aşamasında stüdyo sürecinin, öğrencilerin yaratıcılığı, katılımcı öğrenme biçimi ve ürettikleri çalışmaların özgünlüğü üzerindeki etkilerini anlamaktır. Beaux-Arts ve Bauhaus okullarındaki stüdyo işleyişine ilişkin tarihsel bir bakış açısıyla başlayan ve günümüze kadar olan mimarlık pedagojisindeki önemli değişimleri inceleyen tez, COVID-19 pandemisi sırasında ortaya çıkan kısa süreli çevrimiçi öğrenme ortamında stüdyo öğreniminin, mimari eğitimdeki stüdyo tarihi ile ilişkilendirerek incelemeyi amaçlamaktadır. Bu çalışma, TED Üniversitesi Mimarlık Bölümü'nde 2020-2021 döneminde çevrimiçi stüdyo eğitimi almış öğrencilerin çalışmalarının süreçleri ve çıktılarını stüdyo ortamının etkisi açısından inceleyecektir. Bu araştırma öğrenciler arası iletişim, ekip çalışması, araştırma ve üretim süreçleri ile ortaya çıkan ürünlerin çeşitliliğinin değerlendirilmesine dayanmaktadır. Bu tez, COVID-19 pandemisi süresince mimari tasarım stüdyolarında uygulanmış olan çevrimiçi öğrenme deneyimini, tasarım stüdyosu geleneklerinin daha geniş bağlamı içerisinde konumlandırarak mekansal değişimin öğrenci çalışmaları ve tasarım süreci üzerindeki etkilerini anlamayı amaçlamaktadır.

Anahtar Kelimeler: Mimari pedagoji, Stüdyo ortamı, COVID-19 pandemisi

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To My Parents…

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LIST OF ABBREVIATIONS

HBCU	Historically Black Colleges and Universities
METU	Middle East Technical University
RIBA	Royal Institute of British Architects
TEDU	Turkish Education Association University
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO/UIA	United Nations Educational, Scientific and Cultural Organization/International Union of Architects
UNICEF	United Nations International Children's Emergency Fund
YÖK	Yüksek Öğretim Kurumu

CHAPTER 1
INTRODUCTION

Architectural education has long been associated with a studio environment, characterized as a collaborative and creative space for students. Originating with the Beaux-Arts movement, the studio notion has been very much integrated into architectural pedagogy. As Ashraf M. Salama states in his book, Spatial Design Education: New Directions for Pedagogy in Architecture and Beyond: "Design education can be regarded as the cornerstone of the profession of architecture while the design studio is the backbone of architectural education." (Salama, 1995) Over time, following its emergence within the Beaux-Arts tradition and its transformation through the Bauhaus movement, new studio pedagogies emerged, making the studio the primary space for architectural education. Since then, studios have been integral to architectural education. Today, the studio is not a static space but a dynamic environment in which peer interaction and shared learning shape the design process and the outcomes. Following the COVID-19 pandemic, the traditional studio environment has undergone rapid and unprecedented changes.

The thesis examines the current state of the studio environment in architectural education, specifically the COVID-19 pandemic's impact, situating it in the context of the design studio's emergence with the Beaux-Arts tradition and its transformations following the Bauhaus movement. The aim is to explore how spatial and pedagogical shifts have influenced the design processes and students' preferences in the studio. The 2020-2021 academic year at TED University's Department of Architecture was selected as a case study to provide insight into distance learning in the design process. The thesis aims to reveal characteristics of design processes in studios during a period of distance learning, in search of clues for the future of architectural education in an increasingly digital world.

1.1. Problem Definition

In this study, the studio and its role in architectural education is contextualized by tracing its place within the Western architectural education tradition, as Turkish architectural education is largely modeled on these European models. This contextualization focuses on the emergence of the studio during the establishment of

institutional architectural education at the École des Beaux-Arts and its subsequent evolution through the transformations of the Bauhaus movement. The studio, being the primary physical space for architectural education in this context, houses diverse activities, such as making, communicating, and collective peer interaction.

Turkish architectural education was institutionalized by the earliest schools of architecture, Hendesehane and Sanayi-i Nefise Mektebi. As Uysal stated about the Sanayi-i Nefise Mektebi, "The pedagogical method carried out in the school was established according to the Ecole des Beaux-Arts (School of Fine Arts) model." (Uysal, 2003, p.32)

The influence of the Bauhaus in Türkiye is evident in the educational system of the Department of Architecture at Middle East Technical University (METU). As Uysal mentions in her thesis:

> changes indicate that a kind of Bauhausian approach was started to be applied in the architectural education system in Turkey. The change may not be interpreted as adopting the Bauhaus School's approach to architectural education to Turkey, but may be interpreted as that the architectural education in the country started to share some of the concerns of the Bauhaus approach. It should also be noted that the effect of the Bauhaus system did not transform the system radically; only some of the ideas of the Bauhaus program started to be effective in the period, especially in the studio courses. (Uysal, 2003, p.40)

More recently, the Department of Architecture at TED University (TEDU), which was founded by a faculty with experience at METU, has a similar understanding of architectural education. As stated in the Studios Handbook prepared by the Department of Architecture in TED University:

> The modern design education has achieved its basic reform with the school Bauhaus in Germany, 1919. Students of the school were required to complete a "Preliminary Course" (*Vorkurs*) in their fi rst year. The course developed a method for the education of the creative individual that was based on analysis and research rather than copying old masters, which was the practice in traditional schools. It replaced the myth of *talent* with *methodology*. The "*Basic Design*" courses in many architecture and design schools as the beginners' Studio course all over the world have evolved on this foundation.

> In TEDUArch, we acknowledge this heritage, while we also apply new adjustments following contemporary developments. We eventually preferred the name "*Basics of Design*" for our ARCH 101, which implies more room for richness, diversity and multitude. (TED University Department of Architecture, 2015, p.6)

Although the characteristics of the studio environment have changed over the years, the studio has remained the common ground for architectural education as a collective space until the recent, sudden shift in architectural education due to the COVID-19 pandemic. This study seeks to contribute to the literature on how the studio environment affects the design process and outcomes by examining the sudden shift in architectural education towards online education, drawing on insights from changes in studio culture that the author directly experienced. This firsthand account is accompanied by a survey conducted among the author's peers, who have experienced both face-to-face and online studios during their architectural education. Evaluation of survey responses will be framed in terms of conjectures about changes in students' perceptions of peer interaction, the studio environment, and working styles. The thesis aims to examine the effects of the studio environment on creativity, collaboration, and originality, as reflected in students' responses to the survey administered by the author.

1.2. Structure of The Thesis

The thesis is organized into six main chapters that examine the evolution of architectural design studios from their historical origins to their sudden transformation by the COVID-19 pandemic. The sudden change affected not only the physical design studio space but also peer interaction, students' design processes, group work, and the studio's end products.

In the first chapter, the research question is formulated, the problem is defined, and the thesis outline is presented. It also provides a literature review that includes primary sources, with a focus on the studio.

In the second chapter, the historical evolution of the architectural design studio is examined through an investigation on its origins in the Beaux-Arts tradition and its transformation in the Bauhaus school. The roots of the design studio can be traced back to the École des Beaux-Arts. After a brief introduction about the school, the school's education system is examined in two separate titles: the 'atelier' and the

‘concours’. While ‘atelier’ has transformed today into a studio, ‘concours’ meant architectural competitions. As stated by Chaffe, “An atelier is a studio; an architectural atelier is a drafting room. Every student of architecture at the Ecole des Beaux-Arts learned to design in an architectural atelier.” (Drexler et al., 1977, p.88) and “*Concours d’émulation* (competitions) were the method by which students’ designs were judged. The largest number of these *concours* were in architectural composition, and they were of two kinds: *esquisses* (sketches) and *projets rendus* (rendered projects).” (Drexler et al., 1977, p.83) The Beaux-Arts architectural education system is analyzed through the ateliers together with peer interaction, concours, peer work, and evaluations of end-products. Following this account on the beginnings of the design studio, its reformulation within the Bauhaus School is investigated. The model of education in the ‘studio’ shifted from one master to another in the early years of the Bauhaus School. Therefore, the first three masters of Vorkurs (Preliminary Course), Johannes Itten, Laszlo Moholy-Nagy and Josef Albers, reshaped the studio (Vorkurs) with their own points of view toward the design and design process. This chapter is concluded with an exploration of how architectural education in Türkiye changed with the introduction of ‘studio’ in the programs of architectural education. The influences of the Ecole des Beaux-Arts School and the Bauhaus School on architectural education in Türkiye are discussed. The first educational institutes of architecture, Hendesehane and Sanayi-i Nefise Mektebi were analyzed with a focus on how the ‘studio’ started to play a role in the architectural education system of the country. This chapter provides the historical context of the ‘studio’ in the Western tradition of architectural education and its influences in Türkiye. Through an examination of the historical framework, it reveals various concepts related with the studio working environment, such as peer interaction, teamwork, competition, and end-products. Therefore, in this context, ‘studio’ is not merely a space for architectural education but constitutes the core of a pedagogical model of architectural education.

Chapter three explores how the COVID-19 pandemic transformed architectural education across different countries. Several articles documenting surveys from around the world have been selected as case studies to provide a global, inclusive view of changes in the architectural education system, specifically distance learning. The selected articles document surveys that were conducted in the United Kingdom, the United Arab Emirates, the United States of America, and Türkiye. While some surveys

included students' views, others also included instructors' perspectives. Across the findings of global surveys, the chapter presents a broader view of the new education system, highlighting similarities throughout the design process. By comparison, the chapter underlines the shared challenges and agreements encountered during the distance-learning process in the new online 'studio' environment. This chapter outlines a brief transition from the historical 'studio' to the online 'studio' environment, exploring the characteristics of an altered format of architectural education in terms of peer critique, teamwork, spatial needs of students, and the collective learning process.

Following the historical context of the studios and an overview of global responses to distance learning, the fourth chapter presents the core discussion of the study, based on a survey conducted by the author at TED University, who had experienced online architectural studio education alongside face-to-face education. The survey was conducted online with the approval of the TED University Human Research Ethics Committee (Appendix G). The chapter analyzes students' perceptions of the online architectural education system in five sub-sections. The studio process, online group work, peer interaction, end products, and students' overall preferences were included in the survey. An analysis was conducted using both qualitative and quantitative data from the survey. Each question was examined in detail, and all survey items were assessed by comparing responses. The chapter illustrates how the sudden transition affected the studio's perception among students and how the lack of a studio environment affected creativity, the design process, and peer interaction. The survey outcomes are examined in terms of the difficulties and benefits associated with the online education system.

In the fifth chapter, the study synthesized the historical context, global responses to distance learning, and the specific experience of online architectural education at TED University. How the COVID-19 pandemic affected architectural education is explored with a focus on the studio, peer interaction, and spatial qualities. This exploration is based on the conjecture that the design studio is a socio-pedagogical environment, in addition to being a physical space, that allows students to study.

In the sixth chapter, the study is concluded with a discussion of the evolution of the studios and the rapid changes experienced after the COVID-19 pandemic.

1.3. Literature Review

The historical context of the studio's evolution in architectural education is demonstrated through literature on the educational systems of the École des Beaux-Arts and the Bauhaus. A brief account of the implications of these pedagogies for Turkish architectural education follows.

This historical context provides a foundation for discussing transformations in architectural education during the COVID-19 pandemic globally, with a focus on several surveys conducted in various locations. *The architecture of the Ecole des Beaux-Arts*, edited by Arthur Drexler, included essays by Richard Chaffee, Arthur Drexler, Neil Levine, and David van Zanten. The book offers an inclusive view of the École des Beaux-Arts. It also provided a historical framework of an architectural education system structured around collaboration, peer learning, competitions, juries, and ateliers. (Drexler & Museum of Modern Art, 1975) Another book, *The Ecole des Beaux-Arts and Architectural Education,* written by Paul P. Cret provided readers with an overview of France during the establishment of the Ecole des Beaux-Arts. (Cret, 1941) Both references provided an overview of the École des Beaux-Arts education system, covering different aspects in detail.

Following the École des Beaux-Arts, the second major shift in architectural design education occurred with the Bauhaus. The reference sources used in this study are primarily about the Bauhaus School's view on the basic course, which is named as 'Vorkurs'. *The Bauhaus 1919-1928* book, edited by Herbert Bayer, Ise Gropius, and Walter Gropius, provides brief information about the Bauhaus and the Deutscher Werkbund. It documented the Bauhaus's historical background and explored its curriculum, end products, and the educational structure of experimental learning. (Bayer et al., 1938) *"Manifesto of the Bauhaus,"* written by Walter Gropius, is used to directly explain what Gropius wanted to achieve with the school of Bauhaus. The four-page leaflet was published at the beginning of the school year and provided the objectives and aims of the school, explaining the classes and teaching methods. (Gropius, 1984) While these references were used to explain the Bauhaus school's overall education system, others were used to cover specific dates in its history. *"Design and Form: The Basic Course at the Bauhaus"* book was written by Johannes Itten. Itten's book is used to explain Itten's ideas about 'Vorkurs', how he conducted the lectures, sensory experiences, systematic study of form and color theory. (Itten,

1963/1975) *The new vision and abstract of an artist*, written by László Moholy-Nagy, described Moholy-Nagy's approach to studio practice and to teaching architecture, along with the outcomes of his students' work in his 'Vorkurs'. The book is referenced to explain his tactile exercises, sensory training, and experience with materials. It also provided the outcomes of these exercises, as evidenced by the end products. (Moholy-Nagy, 1928/1947) The article "Teaching form through practice" was written by Josef Albers. It provided an insight into Josef Albers' pedagogical methods for architectural design education. It explained Albers's concept of materiality and his educational method, which focused on experience itself rather than the studio's end products. (Albers, 2013) While these references provided insights into the 'Vorkurs' as explained by the master himself, Rainer K. Wick's "Three Preliminary Courses: Itten, Moholy-Nagy, Albers" article offered a comprehensive view of education at the Bauhaus School. Each lecturer's methods are collectively explained and discussed. The book is referred to give a clear comparison for the reader by creating an overview of the Vorkurs' not from the master himself, but from a generalized view. (Rainer, nd.)

In the next section, Türkiye's institutionalized architectural education is explored in the context of global movements in architectural design education, such as the École des Beaux-Arts and the Bauhaus. While some of the references used were to explain the foundation of design education in Türkiye, some of them explored the contemporary school's attitudes on architectural design education. "Ottoman Imperial School of Fine Arts' Department of Architecture: Foundation Years and Early Graduates" is an article written by Seda Kula. It provides an insight to the Sanayi-i Nefise Mektebi established in 1883. The article explains the school's format, curriculum, and organization. It also provided the reader with how the school was founded on the foundations of Ecole des Beaux-Arts. (Kula, 2023) A Survey on the System of Education at the Middle East Technical University Department of Architecture, 1956-1980 is a master's thesis written by Yüksel Yeşim Uysal at Orta Doğu Teknik Üniversitesi. The thesis focused on the pedagogical model of METU between 1956 and 1980. The article is referenced to explain the socio-political environment during 1956-1980. The thesis also explained the institutionalization of architectural education, the studio concept in Türkiye, and linked the historical global changes with Türkiye, explaining Türkiye's common state. (Uysal, 2003) The TEDU Arch Studios Handbook is a booklet prepared by the TED University Faculty of

Architecture, Department of Architecture, in 2015. Prepared largely by the efforts of Bilge İmamoğlu, the handbook covered studio culture, studio courses, studio instructors, assignments and projects, the design process, in-situ studies, lectures and workshops, critiques, presentations, juries, and, lastly, studio ethics in detail. The booklet describes the architectural studio at TED University, what it meant, and how it was conducted. (TED University Department of Architecture, 2015)

For the third chapter of the thesis, literature concerning the transformations in architectural education under the influence of the COVID-19 pandemic is analyzed. Articles presenting the findings of recent surveys, conducted in different parts of the world, provide a comprehensive overview of the reception of the different actors involved in these transformations. The article “Shutting the studio: the impact of the COVID-19 pandemic on architectural education in the United Kingdom” was written by Robert Grover and Alexander Wright, who were lecturers at the University of Bath during the COVID-19 pandemic. The article explores the rapid changes in the architectural design education system in RIBA-validated schools. The article provided quantitative data on students’ and staff members' views regarding the sudden shift to online education. (Grover & Wright, 2023) Dana Khalid Amro surveyed the United Arab Emirates and published it under the title “The Impact of COVID-19 Lockdown on Design Students’ Performance: A Case Study in the UAE.” The survey focused on the shift to online education during the COVID-19 pandemic, with the answers from students in the College of Fine Arts and Design. The survey provided an insight into students’ views on the design education process during the COVID-19 pandemic in the United Arab Emirates. It explained how the sudden shift was experienced in the United Arab Emirates in terms of mental health, creativity, and performance. (Amro, 2022) The research by Dahlia Nduom and Farhana Ferdous surveyed the rapid shift in online architectural education in the United States, with a focus on Historically Black Colleges and Universities (HBCUs). It’s used to show how students from various HBCUs reacted to the sudden shift. (Nduom & Ferdous, 2021) “Challenges Faced by Students in Online Architectural Design Studio During COVID-19 Pandemic: Universities in Sarawak” is an article written by J. W. Mervyn Hsin, M. A. B. Mohamed, R. N. S. B. R. Mohd Yazit, and J. C. Y. Ho. The article provided an insight into the challenges that students faced during the COVID-19 pandemic in Sarawak, Malaysia. It included a survey completed by a total of 117 students at the University

of Malaysia, Sarawak, and the University College of Technology, Sarawak. It's referenced to show students' perceptions the Malaysian educational system during COVID-19. (Mervyn Hsin et al, 2023) "An Evaluation of the Impact of the COVID-19 Pandemic on Architecture Design Studio Education from the Perspective of Architecture Students" is an article by Ebru Pekdaş and Burçin Kutsal. The survey included students from different schools in Türkiye. The article included information on common approaches to online education in Türkiye and asked questions common to all schools. The survey is used to provide an insight of the students' reactions to the change in the education system in Türkiye during the COVID-19 pandemic. (Pekdaş & Kutsal, 2021) These references showed global changes in architectural education systems during the COVID-19 pandemic. They were referenced to show the regional differences and similarities in their way of exploring, which was researched in detail.

This study contributes to the literature on the impact of the studio environment on architectural design education by examining its characteristics derived from its historical evolution and by discussing transformations during the COVID-19 pandemic. By using the 2020-2021 academic year at TED University as a case study, the thesis discussed the transformations in architectural design education and the fundamental values of design education throughout history, examining Ecole des Beaux-Arts and Bauhaus in detail.

CHAPTER 2
ORIGINS OF THE DESIGN STUDIO IN ARCHITECTURAL EDUCATION

"The architectural design studio is the backbone of the education of future architects. It occupies a central position in architectural education." (Salama, 1995, p.7) As Ashraf Salama noted, the architectural design studio is one of the most important components of architectural design education. The origins of the design studio trace back to two primary movements in architectural education: the École des Beaux-Arts and the Bauhaus.

> Although these two approaches seem different, they are in fact based on the same principles in relation to society and the needs of users. Since they have laid emphasis on the formal aspects of architecture, and form fundamental and dynamics with little concern for socio-cultural issues. (Salama, 1995, p.39)

While shaping the fundamentals and formal aspects of architecture, both institutions emphasize the design studio. In this sense, these two institutions laid the foundations for the design studio and shaped how students learn by practicing in it. Both education systems view the studio as a place for making, thinking, and practicing. In this chapter, these two movements and their institutional pedagogical ideas towards the studio will be examined.

2.1. Beaux-Arts: From Apprenticeship to Formal Education

As Salama Ashraf explained, the shift from apprenticeship to formal education in architecture began with the École des Beaux-Arts. "With the establishment of formal architectural schools. There was only one model of education: Beaux-Arts education, in France, that emerged in response to the value system of the time and the needs of the government." The French government took an early step toward formal architectural education compared with other states. "In the seventeenth century, the national government of France undertook for the first time to foster architecture as one of the fine arts by supporting schools for the education of artists." (Cret, 1941, p.3) Before this move by France, architecture had long been considered an apprenticeship under master craftsmen. (Cret, 1941, p.3) Following its launch, the École des Beaux-Arts became one of the most influential schools of architectural design in a short time.

> The Ecole des Beaux-Arts in Paris taught architecture from 1819 until 1968. The school was not newly formed in 1819, however; rather it had been transformed between 1793 and 1819 from the schools of the Académie Royale de Peinture et de Sculpture and the Académie Royale d'Architecture. (Drexler et al., 1977, p.61)

As can be understood from P. P. Cret's account above, the Ecole des Beaux-Arts School did not establish itself from scratch, but instead transformed from two already existing schools in France, and they created a system and provided formal architectural education to the students. The shift was not fast; but it was strict. Soon, the École des Beaux-Arts became a universal school that attracted students from around the world. "Although hundreds upon hundreds took the five-part entrance exam (which was a mark of the Ecole's prestige), the school only admitted sixty students per term, 45 French and 15 foreign." (Fricker & Fricker, 2010 p.2) It was challenging for students to gain admission to the École des Beaux-Arts and to obtain an education. The school not only taught architecture but also provided a well-rounded education that focused on art and philosophy. "Students received broad instruction in painting, sculpture, history, geometry, philosophy, and mathematics." (Fricker & Fricker, 2010 p.2)

To understand the Ecole des Beaux-Arts pedagogical structure, atelier and concours should be considered. These two notions gave rise to the École des Beaux-Arts educational system. The ateliers were the social and spatial spaces where students worked, debated, and developed design ideas with peers, and concours were the competitions in which patrons criticized these outcomes. These two piles at the École des Beaux-Arts also influenced architectural education worldwide. In the following sections, the ateliers and concours will be examined in detail to give a deeper understanding of the evolution of architectural education at the Ecole des Beaux-Arts.

2.1.1. Work In Atelier

École des Beaux-Arts education was organized around ateliers that students attended. Ateliers were where students worked, drew, talked, and developed design ideas. Ateliers were focusing on specific fields. "An atelier is a studio; an architectural atelier is a drafting room. Every student of architecture at the Ecole des Beaux-Arts learned to design in an architectural atelier." (Drexler et al., 1977, p.88) These ateliers were run by patrons who were professors in their fields. A different patron ran every atelier, and "In regard to design, construction, and drafting-room work, the pupil may choose any professor as guide and adviser." (Cret, 1941, p.12) Patrons guided students,

provided critiques, and created competitions. “The choice of a professor is not even limited to the existing ateliers. However, to serve on the jury of awards, the Patron of an atelier must have a fixed minimum of students who have successfully passed the entrance examination to the Ecole des Beaux-Arts.” (Cret, 1941, p.12) Chafee explains how the design ateliers are as follows:

> Architecture was taught at the Ecole des Beaux-Arts, for the patrons truly were the professeurs d’architecture, as they officially were titled. They transmitted their theories of architecture in the most effective way, face to face with their students, talking about those students’ designs. (Drexler et al., 1977, p.94)

As well as patrons, “by the 1930s many of the patrons had one or two assistants, who often did most of the teaching.” (Drexler et al., 1977, p.95) These assistants also provided critiques to the students and supported their design process. “Ateliers were the places where students learned architecture.” (Drexler et al., 1977, p.61) “An atelier is a studio; an architectural atelier is a drafting room. Every student of architecture at the Ecole des Beaux-Arts learned to design in an architectural atelier.” (Drexler et al., 1977, p.88) It can be said that ateliers (as shown in Figure 1 below) were the first form of design studio, in which students had the opportunity to work with a patron and learn by practicing alongside peers and assistants. “Besides the friendly influence of the Patron, the atelier's other important feature is the exchange of advice, help and criticism among the students themselves.” (Cret, 1941, p.11) As is evident, ateliers were spaces where a culture of learning through observation, peer feedback, and knowledge sharing emerged. Therefore, “the single student in an atelier was the exception; most of the Ecole students chose to group together.” (Drexler et al., 1977, p.89) “Members of each atelier also worked together in lesser concours.” (Drexler et al., 1977, p.91) Ateliers were not individualistic spaces but common spaces where students worked together, helped one another, and developed designs. They were large drafting rooms where students interacted with one another. While competing together, they expanded their visions and prepared for the Prix de Rome, the École des Beaux-Arts' most prestigious competition. Therefore, ateliers served as the working ground for collective work. Chafee stated the space's qualities as “The needs were few: space enough for drawing boards for all the students, big windows for light, water for mixing colors, and a low rent.” (Drexler et al., 1977, p.90) The students elected one person to be their “massier,” who covered the atelier's costs, such as rent, books, and more. (Drexler et al., 1977, p.91) Therefore, these ateliers were social spaces where students

could learn diverse perspectives on design and develop their own approaches to designing.

The atelier was not an isolated component of education at the École des Beaux-Arts; rather, it served as the ground for concours (competitions). It was the space where students worked on the concours, developed new techniques, broadened their perspectives, and practiced. Therefore, the outcomes of these processes could not be separated from the atelier itself. The next section, Concours at the École des Beaux-Arts, illustrates the institution's overall architectural education model.



Figure 1.

Students at the atelier. (Drexler et al., 1977, p.91)

2.1.2. Concours (Competitions) and Jury

Education at the École des Beaux-Arts was structured around the atelier and the concours, which gave rise to a jury system. Ateliers had been the design studios for students in the Beaux-Arts school, and the "Members of each atelier also worked together in lesser concours." (Drexler et al., 1977, p.92) Concours (competitions) were vital for the architectural education of the Beaux-Arts. "In the system of study at the Ecole as it was finally formulated the student advanced through a series of monthly

competitions that tested his ability to sketch or to fully render a project for a given program." (Drexler & Museum of Modern Art, 1975, p.9) As stated, multiple competitions led students to receive numerous critiques, evolve over time, and prepare for larger competitions. As Chafee explained, students who were in the same atelier sometimes attended concours together, and "Each atelier was in rivalry with all the others." (Drexler et al., 1977, p.92) This rivalry prompted every atelier to improve its designs and strive for more. Because each atelier was run by a different patron, the competition design outcomes also reflected the atelier's characteristics and, ultimately, the patron's. Therefore, this rivalry motivated the students and broadened their perspectives through feedback, critique, and peer comparison. Juries would criticize the work of students from each atelier (Figure 2). However, until the decision was made, the jurors would not know the competitors' names and would determine the winner anonymously. (Drexler et al., 1977, p.90-92) "If the jury awarded a mention or médaille to someone in the atelier, the whole group would be proud;…" (Drexler et al., 1977, p.93) The awards were not only medals but also "the greatest being the Prix de Rome (Prize of Rome), which provided a scholarship to the honored one to study in Rome, then regarded as the fountainhead of classicism." (Fricker & Fricker, 2010,p.2)

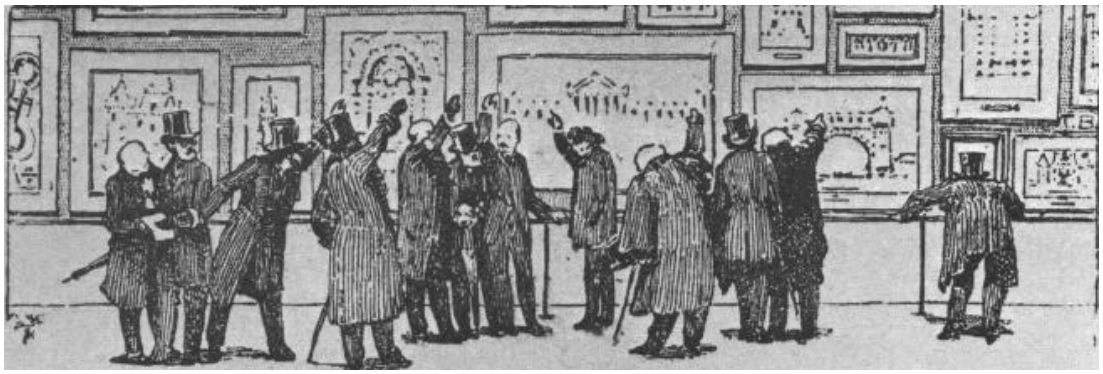


Figure 2.

Jury members judging a competition at the Ecole des Beaux-Arts. (Drexler et al., 1977, p.92)

Design education in the École des Beaux-Arts system began with students selecting the appropriate ateliers. Students selected ateliers according to their preferences and tendencies. A candidate aspiring to the Grand Prix de Rome would choose an atelier led by a member of the Institut, the organization that administers this prestigious

competition. (Carlhian, 1979) “The curriculum for the second class consisted of concours and of the lectures that aspirants were allowed to attend.” (Drexler et al., 1977, p.83) Lectures were not compulsory; however, construction lectures were required. (Drexler et al., 1977, p.83) “Concours d’émulation (competitions) were the method by which students’ designs were judged.” (Drexler et al., 1977, p.83) The student's evaluation depended mainly on the concours; therefore, the jury's opinions were more influential than class attendance. (Cret, 1941, p.14) The concours were in architectural composition with two different types as esquisses (sketches) and projets rendus (rendered projects).” (Drexler et al., 1977, p.83) Second year students were to attend both of the concours. “The projets rendus, a small school, an assembly hall, a small railroad station, and so on; for esquisses, often a part of a building assigned as a project rendu such as the facade of a small public building, a small house, or a village fountain” were requested from the students (Drexler et al., 1977, p.83). Additionally, “every year from 1823 to 1868 there were four construction concours, one for stone, one for iron, one for wood, and one for construction générale, each lasting about four months.” (Drexler et al., 1977, p.83) This addition to the competitions underscores the importance of construction education offered by the École des Beaux-Arts.

Overall, the atelier and concours system of the Ecole des Beaux-Arts created a common ground for continuous design work, comparison, critique, and peer interaction. Concours with anonymous jury evaluations always led students to develop further. A large number of competitions exposed students constantly to design and peer work. Students observed, worked together, and learned from one another. The collaborative and competitive nature of ateliers created a dynamic environment for the architecture students. Over time, ateliers and concours evolved into the two main pillars of architectural design education: the studio and the jury system.

The École des Beaux-Arts shaped architectural education through atelier-based learning and the concours, and it also influenced the modern design studio concept in the early twentieth century. With industrialization and technological developments, new pedagogical movements reshaping architectural education have emerged. The Bauhaus educational system emerged from these changes. The next chapter will explore how the Bauhaus reconstructed the studio, applied design education, and

introduced new ways of learning and collaboration that would influence the architectural studio as we know it today.

2.2. Bauhaus: The Critical Studio

The Bauhaus School was founded by Walter Gropius in Weimar in 1919. However, the idea behind the Bauhaus School and style emerged well after the start of the 1900s, following World War I. Therefore, to understand the Bauhaus, it is essential to consider the school's period, its events, and the ideas that shaped it.

> In Germany, Hermann Muthesius sought a synthesis between the 'machine style' and the Morris 'arts and crafts' movement. He founded the Deutsche Werkbund in 1907 in an effort to effect real cooperation between the best artists and craftsmen on the one hand, and trade and industry on the other. (Bayer et al., 1938 p.13)

Das Deutscher Werkbund was an association of architects, industrialists, designers, and artists who sought to keep pace with the Industrial Revolution and to eschew romanticism. Hermann Muthesius was one of the most important figures behind the association. The Deutscher Werkbund's aim was to turn its face toward industrialization and make the applied arts work alongside it. Joan Campbell explained that:

> The Werkbund pioneers ad-dressed themselves to the task of bridging the gulf between art and industry and worked to realize their vision of a Germany in which the machine, directed by the nation's best artists, would revitalize the applied arts "from the sofa cushion to urban planning. (Campbell,1978 p.3)

Thus, the applied arts ranged from small-scale works, such as sofa cushions, to large-scale works, such as urban planning. It was inclusive and tried to unite art with industrialization at all scales. Walter Gropius, who is the founder of Bauhaus and "a pupil of Peter Behrens, had been introduced to the Werkbund by Osthaus in 1910..." (Campbell,1978 p.39) He sought to understand the capabilities of the Industrial Revolution and material capabilities, and to integrate them with the applied arts. His ideas for a new education system started to be shaped more and more by the time he spent in the Deutscher Werkbund.

> Starting with architecture, Gropius extended his interests into the whole field of the arts. While still at the front, he was at work on a new project for art education, encouraged by the Grand Duke of Saxe-Weimar who had already discussed with him the possibility of his assuming the directorship of the Weimar Art Academy. Gropius wanted to combine the Academy with the

> Weimar Arts and Crafts School to create a consulting art center for industry and the trades. (Bayer et al., 1938, p.14)

By this attempt, the Bauhaus School was founded. In his Bauhaus Manifesto and Program writing, Gropius explains the aim of the Bauhaus School as "The ultimate aim of all visual arts is the complete building! ... Architects, sculptors, painters, we all must return to the crafts!" (Gropius, 1984) In detail, this aim is explained by Gropius in the same text as:

> The Bauhaus strives to bring together all creative effort into one whole, to reunify all the disciplines of practical art-sculpture, painting, handicrafts, and the crafts-as inseparable components of a new architecture. The ultimate, if distant, aim of the Bauhaus is the unified work of art-the great structure-in which there is no distinction between monumental and decorative art. (Gropius, 1984)

The Bauhaus program was designed to achieve this aim. There were only three instructors at the Bauhaus School when it opened: Johannes Itten, Lyonel Feininger, and Gerhard Marcks. (Bayer et al., 1938, p.20) The whole program provided integrated design education for students. "Instruction at the Bauhaus includes all practical and scientific areas of creative work. Architecture, Painting, Sculpture." (Gropius, 1984) The school offered specialized craft courses for these creative works, as well as a design studio course. "During the early period of the Bauhaus, the educational process was divided into three phases: a preliminary course, a general course, and architectural training." (Salama, 1995, p.53) One of the unique courses offered in Bauhaus was the Vorkurs (Preliminary Course). "The Preliminary Course was divided into five classes, each headed by one of the masters. The period of this course was three semesters. The student was required to pass them in order to be qualified to attend architectural training." (Salama, 1995, p.53)

The following sections will analyze how the studio was reconstructed within the Bauhaus education system, drawing on the contributions of Johannes Itten, László Moholy-Nagy, and Josef Albers. Each master reinterpreted the studio with their own ideas, creating an experimental and interdisciplinary environment for the students. Their approaches to the Vorkurs studio restructured peer interaction, common learning, and experimentation. The following section examines Johannes Itten's Vorkurs in detail.

2.2.1. Johannes Itten's Vorkurs

Johannes Itten was one of the pivotal instructors at the Bauhaus because of his contributions to the Vorkurs in its educational system. When Itten got into Bauhaus,

> … his first task was developing the preliminary course (also known, variously, as preliminary teaching, preliminary instruction and basic teaching), which—in addition to the dual concept of teaching artistic and manual skills and thinking—was to remain a core part of Bauhaus pedagogy, despite considerable historical changes and some critical objections, until the closure of the school in 1933. (Rainer, n.d., p.2)

Johannes Itten's 'Vorkurs' at the Bauhaus represents an early model of studio practice in which students engaged with integrated design ideas and experimentation. 'Vorkurs' was the first design course at the Bauhaus that students were required to take. Students who did not qualify for the course were unable to enroll in the other courses. It was the preparatory course in which students were taught the principles of design and art while experimenting with new materials and laying the foundation for their subsequent studies. Itten explains his way of education as:

> Geometrical and rhythmical forms, problems of proportion and of expressive pictorial composition were studied in depth. Tasks involving textures and the evolution of subject, and forms were new. Besides the theory and practice of polar contrast the exercises in relaxation and concentration required of the students proved amazingly successful. (Itten, 1963/1975, p.5)

These lectures and practices, prepared by Johannes Itten for his own courses, were also crucial to the Bauhaus Vorkurs syllabus. Itten tried to create a new program for Vorkurs in the Bauhaus School and explained his courses in the Bauhaus in 3 main tasks:

> The Basic Course presented me with three tasks:
>
> (1) To liberate the creative forces and thereby the artistic talents of the students. Their own experiences and perceptions were to result in genuine work. Gradually the students were to rid themselves of all the dead wood convention and acquire the courage to create their own work.
>
> 2) To make the students choice of career easier. Here exercises with materials and textures were a valuable aid. Each student quickly found the material with which he feels the closest affinity. It might have been wood. metal, glass, stone. clay or textiles that inspired horn most to creative work. Unfortunately, at that time the Basic Course did not have a workshop, where all the basic skills such as planning. filing. sawing. bending, gluing, and soldering could be practiced.
>
> (3) To present the principles of creative composition to the students for their future careers as artists. The laws of form and color opened up to them the

> world of objectivity. As the work progressed It became possible for the subjective and objective problems of form and color to interact in many different ways. (Itten, 1963/1975, p.7-8)

The Bauhaus Vorkurs studio, directed by Itten, was the space where students practiced with the masters and professors; however, they were required to explore and experiment with numerous new materials to develop original designs. As Itten stated, this course provided students with an opportunity to explore their strengths and to create an environment in which they could experiment with new materials under the supervision of both masters of the field and professors. Creativity and imagination were the studio's basis. Even while starting the course, “Itten’s teaching regularly beginning with certain gymnastic exercises suggested by his Stuttgart academy teacher Adolf Hölzel, the aim of which was “to give the body the ability to express itself, the ability to experience, to awaken itself.” (Rainer, n.d., p.3) All students in the Vorkurs were required to complete these exercises together before beginning the design process. Itten's design teaching began by evoking students' inner expression, which he believed would manifest in their work. As can be seen, unlike the previous design, art and craftsmanship education, the new education encouraged individuality, design, and students' imagination. While experimenting, continued peer interactions among students in the Vorkurs broadened their perspectives on design.

As can be seen on the syllabus of Weimar Bauhaus (Figure 3), study in the school started with the Basic Course (Vorkurs) and through the inner circle, students specialized in different materials such as stone, wood, clay, metal, textiles, color, and glass until they graduated.

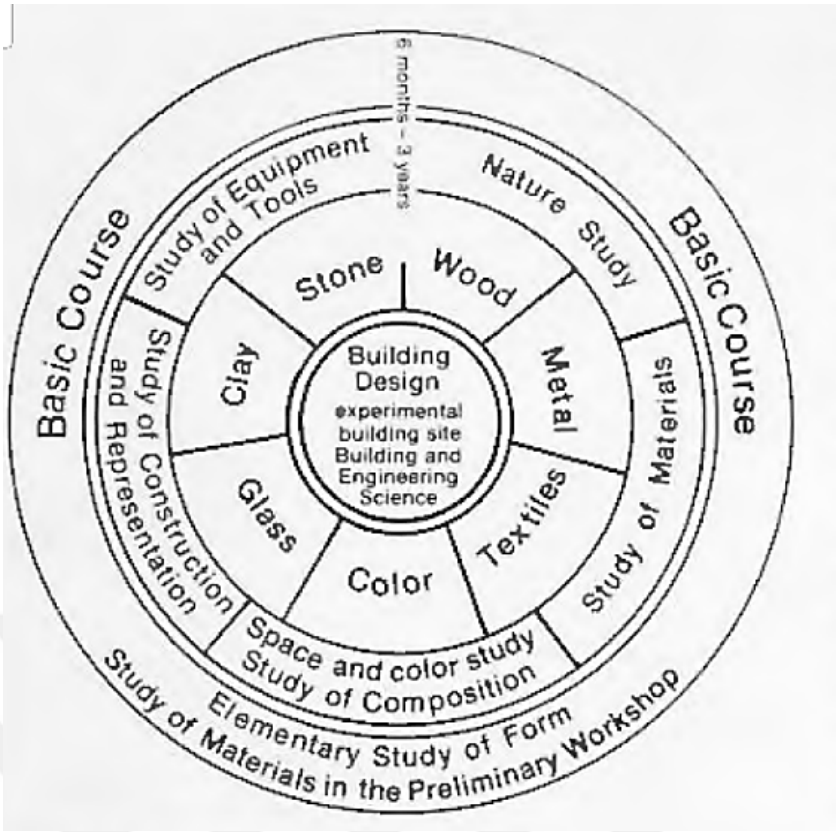


Figure 3.

Syllabus of Weimar Bauhaus. (Itten, 1963/1975, p.8)

In addition to exploring materials, the students studied contrasts. Contrasts included broad-narrow, bright-dark, and color contrasts such as black-white (Figure 4). Another study included precedents and masterpieces of architects. Students were to explore the designs, analyze them, and create a new way to represent and design.

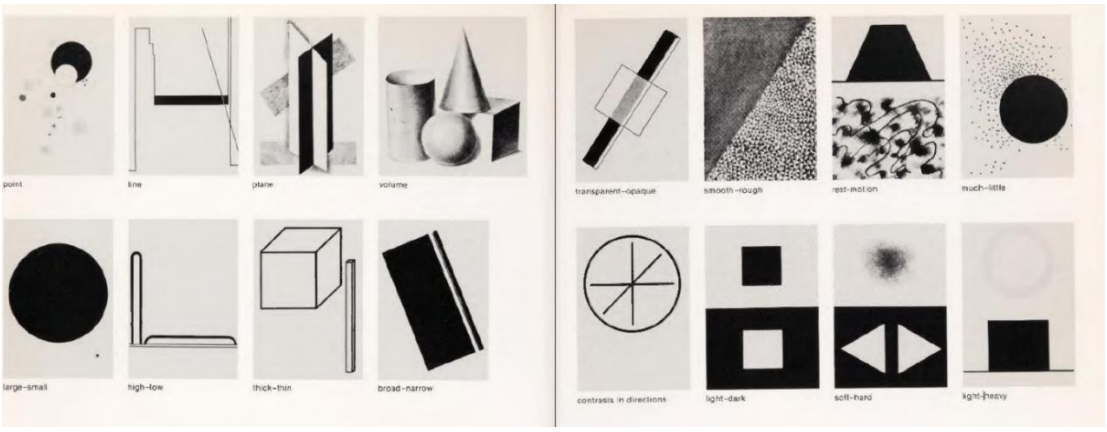


Figure 4.

Representations of contrasts. (Itten, 1963/1975, p.10-11)

Students gained new perspectives through workshops, lectures, prior studies, and peer interactions; therefore, their work was unique and rich in context. Through studies of texture, color, form, and rhythm, they have produced holistic designs. Max Bronstein's composition (Figure 5) harmonizes rhythm, contrast, and texture, creating a three-dimensional montage. Itten explained this work as:

> The spatial three-dimensional montage with its rhythmic and textured forms is held together by differentiated rhythmically tense movement In the spatial study of different materials the main effect of the composition height about 4 ft (120 cm), is concentrated on the formal contrasts triangle rectangle, circle, cylinder, point and line. The differentiation of the effects of the forms by textures is only secondary. (Itten, 1963/1975, p.39)

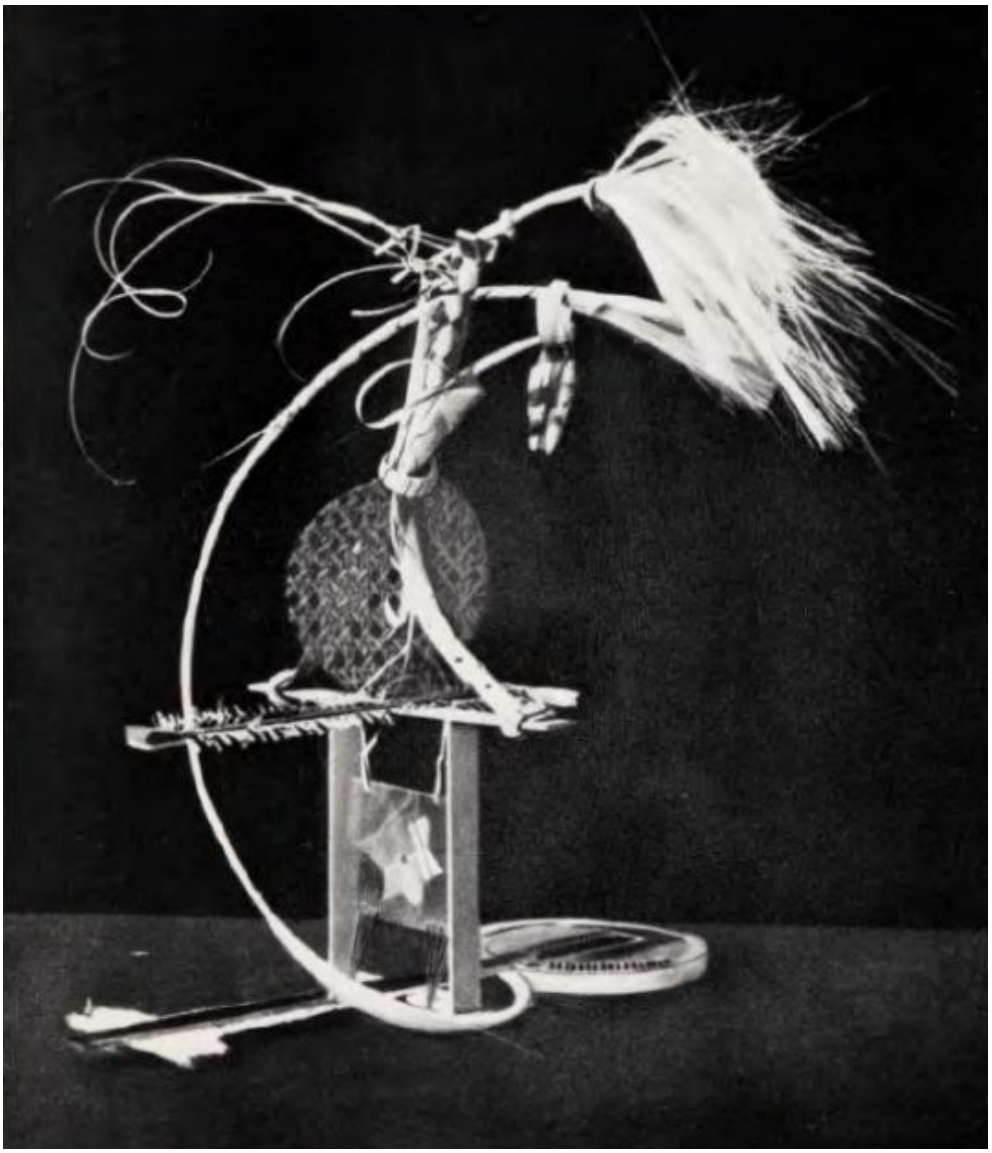


Figure 5.

Max Bronstein's spatial three-dimensional Montage. (Itten, 1963/1975, p.38)

By recognizing their strengths and interests through creating numerous basic designs, students could more easily choose their subsequent studies. Therefore, the studio course under Itten's supervision played a crucial part in the Bauhaus school and education. "Itten tried to apply Vorkurs with scientific methods for the first time and gave Vorkurs its real identity. Vorkurs is the main source of today's basic design courses." (Dede, 2021, p.41) Vorkurs set Bauhaus apart from other schools of its time in terms of education, and Itten's practice in the preparatory course not only distinguished Bauhaus but also established a precedent for the modern studio. However, in 1923, Itten decided to leave Bauhaus. He stated that "An analytical lesson in 1923 caused Walter Gropius to observe that he could no longer be responsible to the government for my methods of teaching. I decided spontaneously, without any remonstrations to leave the Bauhaus." (Itten, 1963/1975, p.13) After his leave, the Bauhaus preparatory studio course was reintroduced under Moholy-Nagy's supervision, and Itten began teaching at his own art college in Berlin.

2.2.2. László Moholy-Nagy's Vorkurs

László Moholy-Nagy began to teach Vorkurs at the studio after Johannes Itten. After he began, he also changed the educational system. He was one of the pioneers of the Bauhaus School's new attitude.

> With his emphatically rational design pedagogy concept, Moholy-Nagy became the decisive executor of the Bauhaus change of course that Gropius began instituting between 1922 and 1923—in the sense of creating a stronger orientation within the school towards technology and industry. (Rainer, n.d., p.6)

As Rainer K. Wick explains, Moholy-Nagy was an instructor who embraced technology and evolved the Bauhaus pedagogy, focusing more on the duality of industry and technology. While integrating his idea into the Vorkurs of Bauhaus, Moholy-Nagy explained his lectures on Vorkurs as:

> It presents the fundamentals of shop work, intellectual integration, the physical and biological sciences, modelling, drawing, lettering, photography, and music or literature. Its objective is spontaneity and inventiveness, to give the student a universal outlook, to make him conscious of his creative power. The method is to keep, in the work of the grown-up, the sincerity of emotion, the truth of observation, the fantasy, and the creativeness of the child. (Moholy-Nagy, 1928/1947, p.21)

Since the beginning of the Vorkurs, creativity has been the key aspect that students should have gained from the studio. As Moholy-Nagy himself explained, the

importance of creativity in the studio remained unchanged. The Vorkurs, supervised by Moholy-Nagy, sought to deepen material studies and enable students to experience new modes of making. Through deeper exploration of the material, students were able to identify its limitations. “Moholy-Nagy attached particular importance to the 'experience of the material' through primitive tactile exercises.” (Rainer, n.d., p.8) He explained this deepened material study under the name of tactile exercises as:

> Our daily language has retained the traditional "five senses," just as we keep the "twelve signs of the zodiac" and the "four humors." We speak also of a "sixth sense," which is possessed by people living close to nature, a special sense of orientation or of time. The sense of "touch," more than any other, may be divided into o number of separately sensed qualities, such as pressure, pricking, rubbing, pain, temperature, and vibration. (Moholy-Nagy, 1928/1947, p.23)

Touching was a means of teaching and exploring material limitations through variations in Moholy-Nagy's Vorkurs. By exploring material limitations, the notions of equilibrium, weight, balance, and stability began to gain importance in architectural practice. (Rainer, n.d., p.9) Since these notions were what the students were experimenting with, the outcomes of the studio of Moholy-Nagy also reflected on the spatial configurations of students’ works (Figure 6). Therefore, it can be stated that:

> The Vorkurs not only involved the study of new materials, or new approaches to handling familiar substances and understanding their creative and industrial potential; it encompassed a larger conceptualization of making, of space and spatial perception, via a teaching praxis grounded in abstract principles. (Muir et al, 2021, p.98)



Figure 6.

Balance Exercise c.1924 (reconstruction:1967). (Rainer, n.d., p.9)

After Moholy- Nagy's withdrawal from the Bauhaus School in 1928, Josef Albers started to supervise the Vorkurs Studio in the Bauhaus. Josef Albers was a former school art teacher and a graduate of the Bauhaus School. As a Bauhaus graduate, he had attended Johannes Itten's Vorkurs and also taught it alongside the master of the time, Moholy-Nagy. (Rainer, n.d., p.9) As every master has an idea of how to teach, "Albers's pedagogy was, however, more than a mere corollary to Dewey's understanding of 'learning by doing'." (Saletnik, 2022, p.27)

2.2.3. Josef Alber's Vorkurs

Josef Albers, a graduate of the Bauhaus, was the master who taught Vorkurs after Moholy-Nagy.

> Following a year at the Royal Bavarian Academy of Fine Art, in 1919 Albers enrolled at the Bauhaus (studying with Johannes Itten, among others) and from 1923 taught together with Moholy-Nagy in the preliminary course, before taking over the sole direction of this propaedeutic teaching between 1928 and 1933. (Rainer, n.d., p.9)

Unlike other masters, he had the opportunity to study with Johannes Itten and to work with Moholy-Nagy at the Bauhaus. “Albers propagated an educational concept that can be summed up in the concise formula 'learning by experience.’ The aim of his pedagogy was an education that focused on the creative.” (Rainer, n.d., p.9) According to his idea, “Experimenting surpasses studying.” (Albers, 2013, p.130) As a result of his idea, his teaching method was a synthesis of fundamentally material-based experiments. His studio workshops focused on working with materials, particularly at the beginning of new design tasks. Without any tool or method, students were to explore the limitations of the materials and enhance their creativity. (Albers, 2013, p.130) Ultimately, the outcome of the design studio was not the final artwork but an experiment. Josef Albers underlines this attitude in his “Teaching Form through Practice” article as “It is not our ambition to fill museums: we are gathering ‘experience’.” (Albers, 2013, p.130)

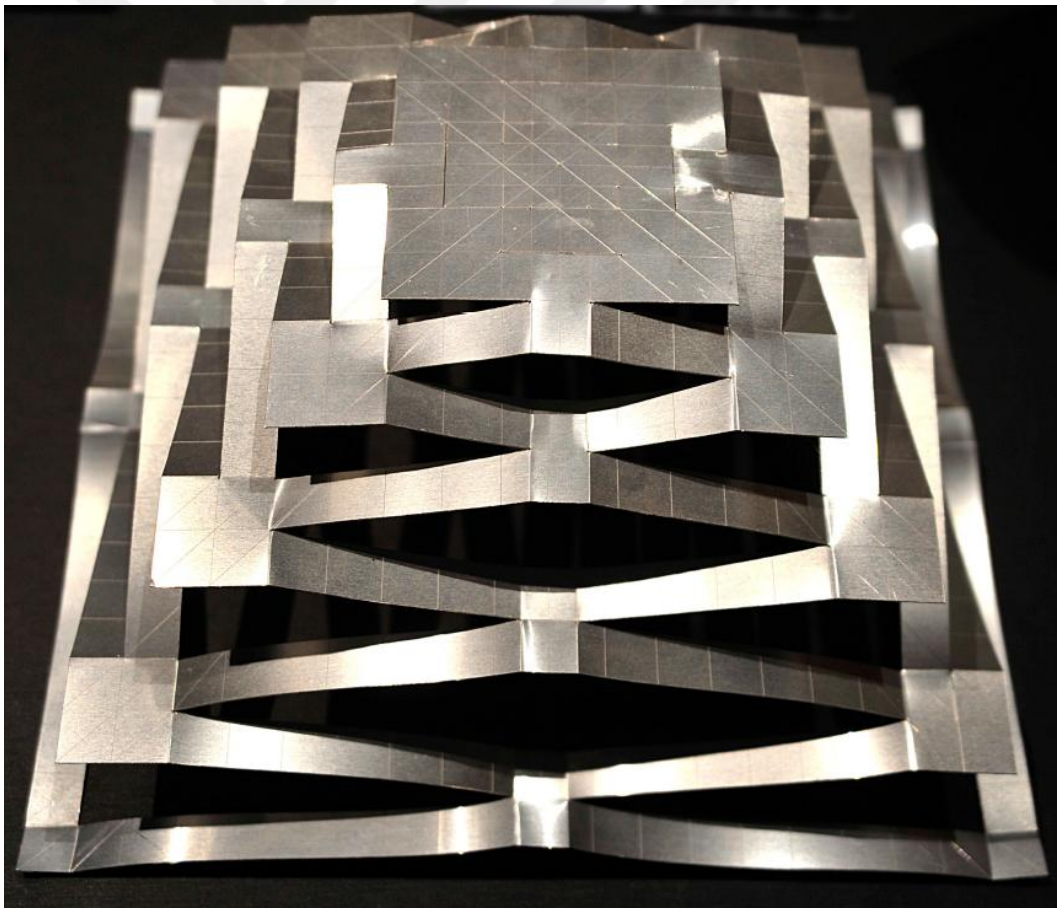


Figure 7.

Material exercise from Josef Albers student Werner Zimmermann, 1927. (Rainer, n.d., p.11)

Design was a process for Albers; mistakes were to be made to have an experience and find the proper way of doing: “Walking begins with crawling, and speaking with baby talk. And mistakes that are recognised promote progress.” (Albers, 2013, p.130) Albers stated this in his article to emphasize that the process takes time and involves mistakes. Still, the experience gained serves as the foundation for the design process rather than the final artwork.

“In Albers’ educational methodology,’ material economics and labor economics are directly intertwined.” (Rainer, n.d., p.12) By the notion of material economy, Albers meant the “optimal material use ‘without loss or waste.’. (Rainer, n.d., p.11) Choosing the materials exposed students to explore the limitations of varied materials; therefore, it was easier to decide on the material that they would move on to work with in the next semester’s courses. (Albers, 2013, p.130)

The design studio for him also emphasized peer communication more than with a professor. In his article, he stated that, “The experience gained in dabbling with materials is often communicated more easily from student to student than by the older, more remote teacher. This is the reason for discussing the work almost daily with the students and having them justify what they have done.” (Albers, 2013, p.130) According to Albers, “Collective dialogue over materials and material exercises reinforces exact observation and new ways of ‘seeing’.” (Albers, 2013, p.131) Therefore, the Albers design studio served as an interaction hub among peers, enabling them to gain experience while enhancing their creativity. To have a successful design process, Albers stated that “As students and teachers we must once again learn with and from one another (and in competition with each other, because that elevates).” (Albers, 2013, p.131)

Josef Albers’ Vorkurs was a space for exploring material limitations. Unlike earlier masters of the Bauhaus School, he emphasized experience over the studio's end product. Albers viewed the studio as a collective field in which students learned from one another and created shared experiences. Through peer critique and shared experiences, Albers’ studio was an active, evolving environment in which students gained experience. Therefore, Albers’ Vorkurs served as a bridge between the Bauhaus Vorkurs and the contemporary design studio.

As the Bauhaus transformed the studio course through experimentation, collective learning, and a material-searching environment, the idea had a profound impact on architectural education worldwide. The following section explores how the design studio evolved in the Turkish context, tracing the influences of the Beaux-Arts and the Bauhaus School.

2.3. Evolution of the Design Studio and the Turkish Context

While architectural education systems have changed around the world, Türkiye was also affected by these changes. “In terms of architectural education, Turkey developed a synthesis of Western pedagogical approaches and the architectural ideologies of the country.” (Uysal, 2003, p.30) The changes followed the same trajectory in architectural education, beginning with the Beaux-Arts and the Bauhaus Schools.

> The initial attempt to change the system of architectural education was transferring the Beaux-Art tradition in the last century of the Ottoman Empire. The second effort was renewing the existing system in the 1930s according to the rise of the Bauhaus standards in the world. Lastly, the establishment of the newly developed American extension of the Bauhaus legacy coincides at the end of the 1950s. (Uysal, 2003, p.30)

“Before the foundation of the engineering schools, Hassa Mimarlar Ocağı (Royal Architects School), which was founded in 1453, was the most significant institution.” (Uysal, 2003, p.31) However, this institution did not function as a formal school but rather as a space for architectural apprenticeship. (Uysal, 2003, p.30-31) “In the 18th century, parallel to the modernization process of the late Ottoman period, two military engineering schools were established: Askeri Humbarahane ve Hendesane and Mühendishane-i Bahri-i Hümayun.” (Uysal, 2003, p.31) Even though these were the first attempts of a formal school for engineers in the Ottoman Empire, they did not work as a complete design school. Following the Ecole des Beaux-Arts' global influence, Sanayi-i Nefise Mektebi was established in 1882 in the Ottoman Empire. (Uysal, 2003, p.31) As Yeşim Uysal stated, “The school was established for providing the education of fine arts.” (Uysal, 2003, p.34) “After the reforms during the late Ottoman period, another significant change in architectural education occurred after the foundation of the Turkish Republic in the early 20th century.” (Uysal, 2003, p.37) “Beginning from 1926, with the cultural pacts with Germany in the 1930s, exchanging teachers between Germany and Turkey not only affected the ruling taste of the architecture of the time, but also the educational system”. (Uysal, 2003, p.37)

Therefore, the architectural education system was directly influenced by the Bauhaus School. (Uysal, 2003, p.38) In the following sections, these changes in the architectural education in Türkiye will be analyzed. The emergence of the design studio, master-apprentice communication, and peer learning methods will be examined through cases such as Hendesehane, Sanayi-i Nefise Mektebi, Middle East Technical University, and TED University.

2.3.1. Hendesehane

Architecture education in the Ottoman Empire "…was initially directly linked to the military and was integrated with engineering." (Salt Galata, 2023, p.1) Before formal architectural education was introduced in the Ottoman Empire, the education system consisted of a practical apprenticeship. (Uysal, 2003, p.31) Architectural education was combined with engineering and practices "…with its origins in the Hendesehâne, or School of Engineering, founded in 1775 as the Ottoman Empire's first educational institution for military engineering." (Salt Galata, 2023, p.1) Hendesehane was also called 'Ecole des Theories' or 'Ecole des Mathematiques' in French documents. (Kaçar, 2008, p.53) The school was opened in the imperial shipyards in İstanbul under the leadership of the French officer Baron de Tott. (Kaçar, 2008, p.75) The students of Hendesehane were volunteers who required knowledge of geometry and its applications in their duties and who wished to take lessons in this subject. (Kaçar, 2008, p.53) This school was officially named the Imperial School of Naval Engineering (Mühendishâne-i Bahrî-i Hümayun) in 1806. (Kaçar, 2008, p.75)

2.3.2. Sanayi-i Nefise Mekteb-i Alisi

After the Ecole des Beaux-Arts School's rise in the architectural education field in France, the Ottoman Empire ordered to establish "… the Sanayi-i Nefîse Mekteb-i Âlîsi, or the Higher School of Fine Arts, in 1882." (Salt Galata, 2023, p.1)

> Osman Hamdi Bey (1842, Istanbul - 1910, Istanbul), and Alexandre Vallaury (1850, Grasse), the first professor Istanbul - 1921, of architecture in the school, are the two main founder figures collaborating for the school's operation until 1909, after which Osman Hamdi Bey passed away and Vallaury left the country. (Kula, 2023, p.2)

"As for the Levantine Ottoman architect Alexandre Vallaury, he was just back in Istanbul after his long Paris years of architectural education at the École des Beaux Arts and some professional work." (Kula, 2023, p.2) Similarly, Osman Hamdi Bey studied painting in Paris and moved on to work in the 1873 Vienna exhibition.

Therefore, he was not far from the innovations of art and architecture education. (Kula, 2023, p.2) Being located in İstanbul and with two masters educated in Paris, a new way of education was introduced to the Ottoman Empire with this institution. The opening of the Nefise Mekteb-i Alisi changed the way of architectural education in the Ottoman Empire from apprenticeship to formal education, as the Ecole des Beaux-Arts School had done in France. "This school broke away with the traditional roots of the apprenticeship in architecture and undertook to establish a new architectural theory… it is significant as being the first school where questions related with architecture was started to be evaluated." (Uysal, 2003, p.32) Therefore, it can be stated that, aside from the engineering schools, the Sanayi-i Nefîse Mekteb-i Âlîsi was the institution where formal architectural education first began to be offered. "Owing to the efforts of Osman Hamdi Bey and his team, regulations and curriculum, the construction and equipment of the school building, and the recruitment of the administrative and academic staff were completed in a year." (Kula, 2023, p.4) The first departments to be opened and to provide education were painting, engraving, sculpture, and architecture, along with associated courses such as art history, perspective, ornamentation techniques, design geometry, archaeology, and anatomy. (Kula, 2023, p.4) A master ran each atelier, and the masters had to report to the school principal every three months on the current state of the students' educational progress. (Ürekli, 1997, p.112) The architectural education curriculum had many influences from the École des Beaux-Arts School's curriculum, including "Jury evaluations, two-class layout, workshops system, awarding medals and honorable mentions, Grand Prize, exhibitions, and museums to be created stand out as parallel implementations." (Kula, 2023, p.4)

> Although at the first year of the curriculum, lectures were also given together with drawing exercises, drawing courses were still taken as the basic criteria for the progress of the students. They introduced a system that was directly related with the improvements of the drawings of students, rather than a theoretical framework of architecture… The second year was reserved for the drawing of architectural elements. The first projects were also used in teaching presentation techniques of the projects… Students were expected to design buildings with a classical taste and to present them by using water color. In the forth year, they were expected to study the Ottoman architecture and present a survey about significant buildings in the empire. (Uysal, 2003, p.35)

Each year, the masters were to choose some of the atelier's products and place them in a suitable location where they could be seen. Those who demonstrate competence and

merit here were to be rewarded with medals. (Ürekli, 1997, p.113) One of the most crucial aspects of the school was the exhibitions that were prepared from students' works. (Ürekli, 1997, p.181) "The school council would organize an exhibition every year, and the works would be accepted and rewarded by a jury formed by the council." (Kula, 2023, p.4) Similar to the École des Beaux-Arts, year-end competitions drew on real-world cases, and successful students may have worked with their professors on these projects. (Kula, 2023, p.6) Although the École des Beaux-Arts' educational model had been adopted, there remained a shortage of architects. "Even eleven years after the foundation of the Sanayi-i Nefise Mekteb-i Alisi, not much has changed in the subject of architecture, and the need for trained architects in their nations has not been addressed." (Ürekli, 1997, p.184) Therefore, discussions were going on about the architectural education system of Sanayi-i Nefise Mekteb-i Alisi, and some revisions had been made.

> … a commission had been established in the Sanayi-i Nefise Mekteb-i Alisi. All architects who continued their art were divided into three groups, and separate exams were held. According to students' success and ability, … they were given a diploma. In addition, the successful students' names were recorded in a specially kept book, and copies were sent to all municipality offices so unauthorized architects could not work. (Ürekli, 1997, p.191)

After the changes, the Sanayi-i Nefise Mekteb-i Alisi continued its educational activities, raising the educational level of its graduates. "In 1926, the school was renamed as Academy of Fine Arts (Güzel Sanatlar Akademisi) in accordance with the renovations in the language." (Uysal, 2003, p.37) In 1930, Türkiye and Germany began exchanging teachers, and as a result, the Academy of Fine Arts' curriculum and educational system changed. (Uysal, 2003, p.37-38) One of these teachers was Ernst Egli, who "became the head of the department of architecture." (Uysal, 2003, p.40) The approval of his position had been given by the President of Turkish Republic Gazi Mustafa Kemal (Atatürk), on 9th of October 1927 as "The appointment of Prof. Egli to the position of Architectural and Educational Expertise, whose staff position had been approved, to organize the programs of the Istanbul Academy of Fine Arts, deliver lectures, and participating in instruction." (T.C. Başbakanlık Arşivi, nd.) After becoming head of the institute, he brought a modern understanding of architecture to the Academy of Fine Arts' program, changing the curriculum. (Uysal, 2003, p.39)

> Changes indicate that a kind of Bauhausian approach was started to be applied in the architectural education system in Turkey… It should also be noted that

> the effect of the Bauhaus system did not transform the system radically; only some of the ideas of the Bauhaus program started to be effective in the period, especially in the studio courses. (Uysal, 2003, p.40)
>
> The new arrangement of the structure of architectural education was consisted of two parts. The first part including the first two years was the preparatory years and students were responsible for the art and professional lectures. The last three years was reserved for the works undertaken in ateliers (design studios) and lectures such as aesthetics, history of art and history of the Republic. (Uysal, 2003, p.40)

Egli's efforts had changed how architecture was taught at the Academy of Fine Arts. While he was the head of Academy of Fine Arts, he "also worked as the consultant architect of the Ministry of National Education." (Uysal, 2003, p.40) In 1936, Bruno Taut became the head of the Academy of Fine Arts. (Bozdoğan, 1997, p.163) Unlike Ernst Egli's approach to architecture, Bruno Taut

> was thoroughly ambiguous with respect to this profound dilemma. His legacy in Turkish architectural culture still alternates between equally powerful images of "Taut the modernist" who taught rational, functional design to Turkish students, and "Taut the regionalist" who had a deep reverence for Ottoman architecture and vernacular traditions. (Bozdoğan, 1997, p.163)

2.3.3. Middle East Technical University

After Ankara became Türkiye's capital in 1923, there was a need for higher education institutions. "The idea of establishing a technical university in Ankara had initially emerged during the 1940s." (Uysal, 2003, p.49) "On October 5, 1951 the new government requested an expert from the United Nations (U.N.) in order to take advice on the housing policy and planning. In 1954, the U.N. sent Prof. Charles Abrams." (Uysal, 2003, p.50) After Abrams' notes in Türkiye, he stated that there was a need for a systematic architectural education in Türkiye and the U.N. "invited the Turkish government to a meeting on the objectives of the university on October 6, 1954." (Uysal, 2003, p.52) After talks and agreements, "the school was opened under the name of the Middle East High Technological Institution (Orta Doğu Yüksek Teknoloji Enstitüsü) on November 1, 1956. The first faculty to start education was the Faculty of Architecture." (Uysal, 2003, p.52)

"In 1956, the establishment of the Faculty of Architecture in the M.E.T.U. was assigned to Holmes Perkins, who had been an academician at Harvard University before being appointed as the Dean of the Faculty in Turkey." (Uysal, 2003, p.70) Previously, at Harvard University, Holmes Perkins and Walter Gropius had been in

frequent contact. Even Gropius and Perkins taught in the same studio in 1937. (Uysal, 2003, p.70)

> Although the basic approach to architectural education was not established clearly at the period between 1956 and 1961, the Bauhaus-inspired modernist legacy established in the United States after the Second World War was the general source that directed the Department of Architecture's architectural theory. (Uysal, 2003, p.71)

Therefore, it can be stated that, at first glance, the basis of architectural education appeared American; however, upon closer analysis, the Bauhaus idea proved valid.

> At Harvard, all departments under the sway of radical European modernism believed in the interdependence of the design arts, the role of design as a social art, the vision of collaboration as a process and technique, and the conception of modern design as an attitude involving a rational, analytical approach to problem solving. (Alofsin, 2002, p.206)

As it is familiar to Harvard University's curriculum for architectural education, the curriculum at METU states that "the architectural design studios were established to find solutions to the problems of the region." (Uysal, 2003, p.74)

> According to İnci Aslanoğlu, the Basic Design course covered a variety of works and methods at the academic year of 1956-1957. The course began by compositional exercises and studies on color scheme and ended with an architectural problem that was planning a rural housing project. (Uysal, 2003, p.74-75)



Figure 8.

Architectural design studio at Middle East Technical University, 1957. (Uysal, 2003, p.79)

Similar to the Bauhaus School's Vorkurs, students began the design course with color and compositional exercises; however, unlike other systems, students were also assigned an architectural problem to design. Just as in the Bauhaus design studios, studios at M.E.T.U. were spaces where students studied together, received table critiques from lecturers (Figure 8.), and produced architectural solutions to problems set by the professors. In addition to the design studios, philosophy and theory of design courses were offered to help students develop their own design framework. (Uysal, 2003, p.116)

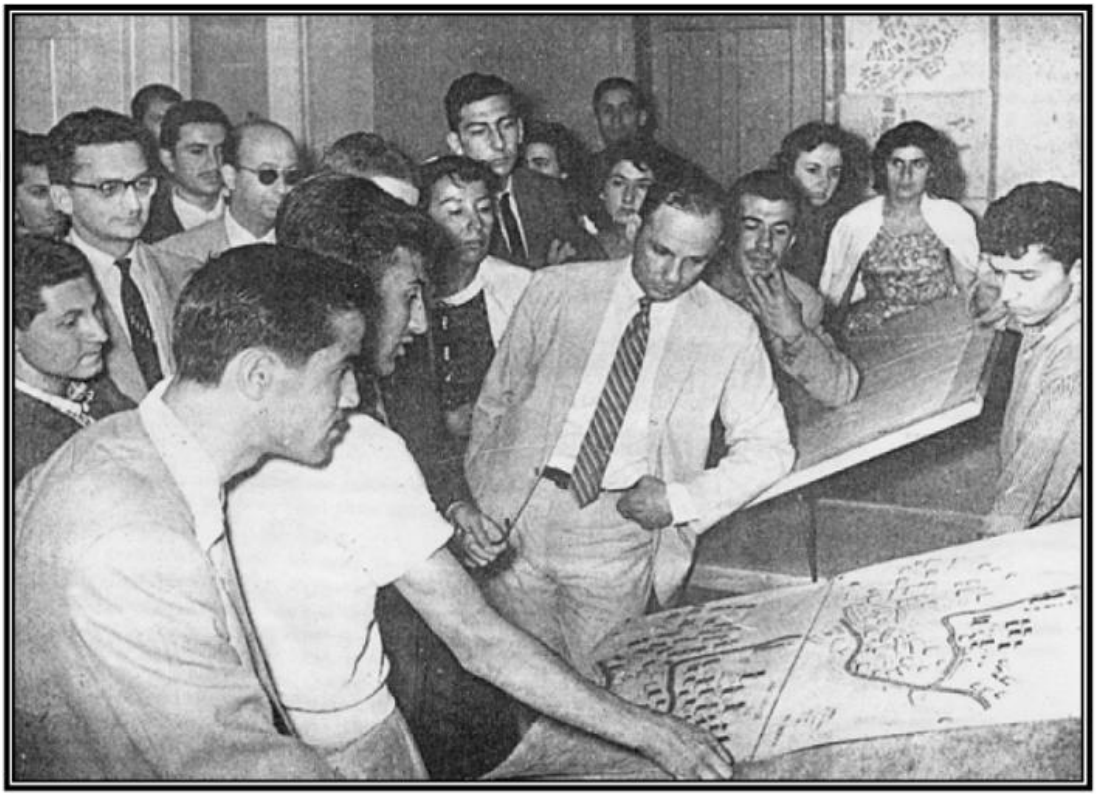
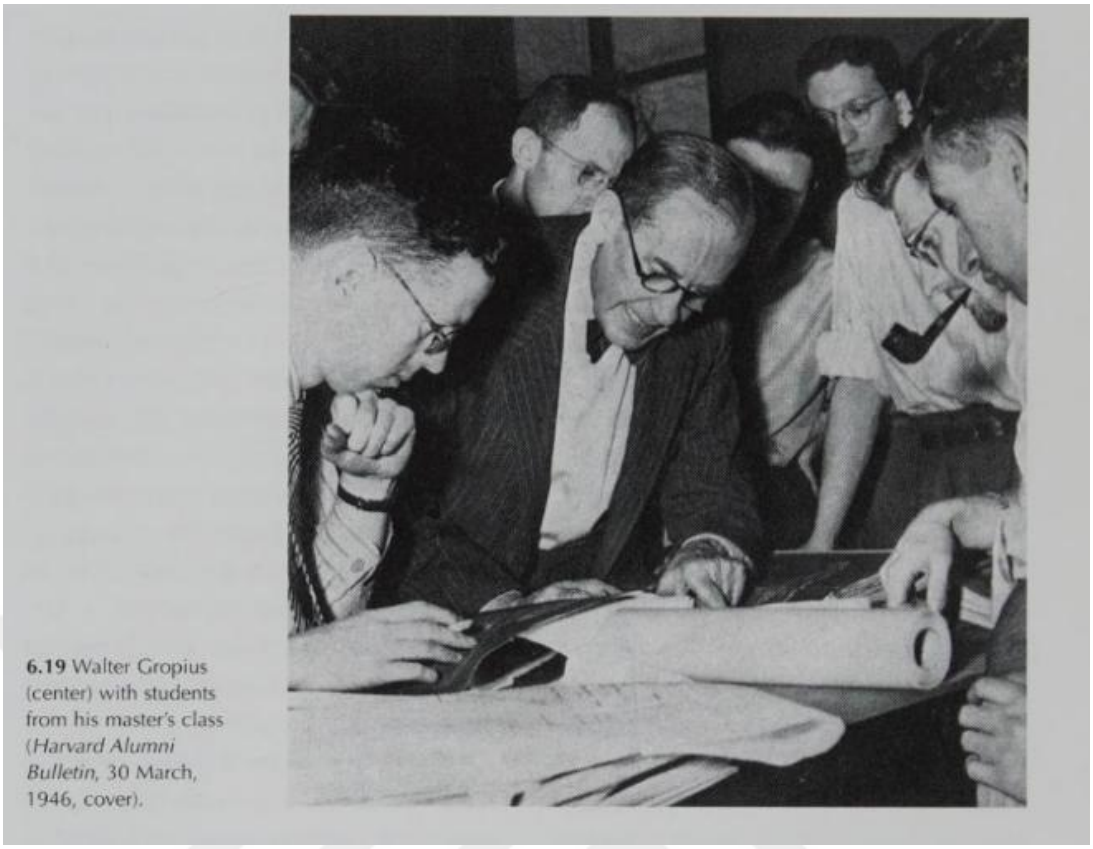


Figure 9.

Table critique in an architectural design studio in Middle East Technical University, 1957. (Uysal, 2003, p.79)



6.19 Walter Gropius (center) with students from his master's class (*Harvard Alumni Bulletin*, 30 March, 1946, cover).

Figure 10.

Walter Gropius with students at his class at Harvard University, 30 March 1946. (Alofsin, 2002, p.213)

2.3.4. TED University

"Türk Maarif Cemiyeti (Turkish Education Society) was established in 1928 in line with the developments of the new Turkish Republic in the field of education." (Acar, 2019, p.24) It was a society established to provide educational support to students. In his article, Mevlüt Çelebi explained the establishment of the Türk Maarif Cemiyeti as;

> On January 31,1928, It was announced that an association called the Türk Maarif Cemiyeti (Turkish Education Society) had been established. The second covenant of the charter of established Türk Maarif Cemiyeti explained its purpose as follows:
>
> A- To establish, maintain, and protect dormitories dedicated to Turkish students both within and outside of the country.
> B- To assist intelligent and hardworking students who, due to poverty, cannot afford higher education to complete their education.
> C- To establish schools that align with contemporary needs to exempt Turkish citizens from applying to foreign schools. (Çelebi, 2004, p.41)

It can be stated that the reasons for establishing the Türk Maarif Cemiyeti primarily focused on the educational support for students. However, “In addition to its role on the development of education during the early Republican decades, the most vivid contribution of Türk Maarif Cemiyeti was the constitution of a college to the post-war period in order to offer education in English.” (Acar, 2019, p.32) Following their decision, in 1931, the Türk Maarif Cemiyeti opened its own school in Ankara, and in 1932, the language of instruction became English for students in fourth grade and above. In 1933, the secondary school also opened its doors to students, and instruction was provided in English across all grades. (Acar, 2019, p.34) From 1946, the name of the Türk Maarif Cemiyeti changed into ‘Türk Eğitim Derneği’ and continued its schools and association under the name of Türk Eğitim Derneği (TED in abbreviation) (Türk Eğitim Derneği, n.d.) In 1951, the school's name was changed to TED Ankara College, underlining the English-language spoken-education system. (Acar, 2019, p.39) After this long tradition of providing high level of education to its students, Türkiye Eğitim Derneği decided to establish TED University.

> Law No: 5913, Date of Adoption: 23.06.2009,
>
> With an additional clause: A foundation university as a public legal personality and named TED University, has been established in Ankara by Türk Eğitim Derneği which is subject to the provisions of Yükseköğretim Kurumları Law No:2547 regarding foundation of higher education institutions.
>
> This university consists of the following, with regard to the Rectorate:
>
> A- Faculty of Education
> B- Faculty of Engineering and Architecture
> C- Faculty of Economics and Administration
> D- Faculty of Art and Design
> E- Graduate School of Natural Sciences
> F- Graduate School of Social Sciences
> G- Graduate School of Education Services (TED University, n.d.)

In the opening statement, architecture was among the first departments established at the university, but it was under the same faculty as Engineering. In 2015, architecture was separated from engineering and established as a faculty in its own right. (TED University, 2016) Over the years, the Department of Architecture has been one of the most preferred departments by the students in the university. (TED University, 2020)

In TED University's architectural education system, studios are vital. In 2015, the 'Studios' Handbook' was prepared by the faculty members of the Department of Architecture, largely by the efforts of Bilge İmamoğlu. The educational system, including studios, was clearly explained in the handbook. "The studio is the core for any kind of design education; whether architectural, industrial or urban design, or any other." (TED University Department of Architecture, 2015, p.1) though some minor changes occurred in the educational method in the studio throughout the years, "it is still the place, where the character of any given school of design is born, shaped, nourished and communicated." (TED University Department of Architecture, 2015, p.1) The education in the studio does not differ from any other studio-based educational methods:

> TEDUArch Studios provide each student a drafting table and storage spaces to be used throughout the year; yet the Studio is much more than an assembly of individual work spaces. The Studio is a public academic space where students share, blend and discuss their educational and personal experiences. It is a melting pot of formal and informal practices of learning. Students learn from each other as much as they learn from their instructors; learn in their free time as much as they do in the class hours. TEDUArch advises benefiting from the collective environment of the Studio for all sorts of studies, especially in the first year, rather than an isolated and individual working setting. (TED University Department of Architecture, 2015, p.2)

As the handbook makes clear, TEDUArch saw the studio as a collective space rather than a fixed classroom. It was not a space to attend classes and listen to professors, but a place for making, creating, doing, and discussing as the studio must be. The difference in the studio also lies in the process of learning. "In the Studio we do not learn and then do; but we learn by doing." (TED University Department of Architecture, 2015, p.7) Therefore, the studio becomes the space for continuous learning: "the studio courses are always about constant engagement, non-stop doing, and then doing again." (TED University Department of Architecture, 2015, p.7) The environment provided by the faculty fully supports students' collective work, both in assignments and in lectures.

> It is essential and central to the architectural and design education that one becomes willing to use the Studio for the exchange of ideas, the formation of critical thinking, the experimentation, and the performance of collaborative work: things that cannot be gained through a textbook or at home alone. (TED University Department of Architecture, 2015, p.3)

As can be seen from this statement, all the forms of the studio in different times and places “brings within a global culture of its own, a characteristic way of doing and understanding things that is similar in all studios all around the world; a sort of studio folklore.” (TED University Department of Architecture, 2015, p.4) While some distinctions may have been valid, the studio culture remains the same. Critiques are among the unchanged parts of the studio. It allows students to understand the work produced and to receive multiple perspectives from different instructors. “Critiques are usually held for a single project each time; still it is also a collective activity. Everyone in the Studio is given the same or similar project/assignment, so it always makes great sense to listen to what is being said for others’ works or even participate in the discussion.” (TED University Department of Architecture, 2015, p.19) They are the small steps that prepare the students for the juries and help their design process until jury week. Jury “is the utmost presentation moment that you present your design process with the whole set of ideas, research and experimentation that evolved into the final design proposal as the ultimate product of the whole semester and receive comments and critiques in return.” (TED University Department of Architecture, 2015, p.25)

The curriculum of architectural education in TEDU Department of Architecture not just includes the studio but also theoretical lessons that help students gain architectural knowledge, such as communication techniques, the history of architecture, and urban design. Even though branches of architecture are being taught, “The departmental courses in each term are structured in a collaborative way so that they support and reinforce each other, and each time, without an exception, the Studio is the base of the whole operation.” (TED University Department of Architecture, 2015, p.5) Therefore, to be successful in a semester of architectural education, the most important course is the studio.

It can be stated that the studio is a vital part of the education in TEDU Department of Architecture’s curriculum. It’s a space for a continuous creating process, learning by doing, and constant peer engagement. While theoretical courses support the main studio course, they are effective in their own right, enabling students to gain broader knowledge and broaden their perspectives.

The history of the studio's origins and evolution in studio-based education, and its place in the Turkish context, underscore its ongoing significance in architectural design education. The next chapter examines the sudden shift in architectural pedagogy caused by the global COVID-19 pandemic. Given the universality of studio education in architectural degrees, cases from around the world are examined to provide a broader perspective on the subject.

CHAPTER 3
DESIGN STUDIO DURING THE COVID-19 PANDEMIC AND ONLINE LEARNING

Throughout its history, numerous events have significantly shaped the evolution of design education. “Design education is a field that changes and transforms with social, cultural, economic, and technological factors. With this change, it is constantly open to new tactics and methods.” (Pekdaş & Kutsal,2021, p.3) With the emergence of the COVID-19 pandemic, “In the period between March 11, 2020 and February 2, 2021, schools have been fully closed for an average of 95 instruction days globally, which represents approximately half the time intended for classroom instruction.” (UNICEF NYHQ et al., 2021, p.2) When looking at the higher education during the same time period, “nearly all regions and countries closed their educational institutions in April 2020, leaving approximately 220 million tertiary education students without physical access regardless of location and national origin.” (Mok & UNESCO, 2022, p.8) Therefore, there was a need for a rapid shift to distance learning and work across all fields. “Over 90 per cent of education ministries worldwide have implemented some form of remote learning approaches that involve radio, television or the internet.” (UNICEF NYHQ et al., 2021, p.10) during the COVID-19 pandemic. Figure 11 shows the estimated number of students affected by school closures by regions of the world. While South Asia was the most affected region, with 95% of students not attending school, North America had the fewest students (0%).

Worl Region	Total tertiary education students	Out-of-school tertiary education students	%
East Asia and Pacific	72,023,158	16,585,403	23%
Europe and Central Asia	38,594,914	17,732,488	46%
Latin America and Caribbean	27,417,286	5,525,576	20%
Middle East and North Africa	7,127,825	3,686,435	52%
North America	20,565,373	0	0%
South Asia	41,882,841	39,634,130	95%
Sub-Saharan Africa	8,306,549	3,182,589	38%
Total	215,917,946	86,346,621	40%

Figure 11.

Estimated students affected by school closures (as of April 2021) by region. (Mok & UNESCO, 2022, p.9)

In architectural education, one of the most interactive courses is the studio course. The studio is a collaborative space and a venue for interactive design critique sessions. Traditionally, studios enhance collaboration between peers and professors, foster creativity, and help students produce unique design outcomes. According to the UNESCO/UIA Charter for Architectural Education, some conditions of an accredited school of architecture are:

1. That adequate studios, laboratories, facilities for research, advanced studies, libraries, information and data exchanges for new technologies should be provided at schools of architecture.
2. That in order to promote a common understanding and to raise the level of architectural education, the creation of a network, on a worldwide basis for the exchange of information, teachers and senior students is as necessary as a regional network to promote an understanding of diverse climate, materials, vernacular practices and culture. The use of external examiners is a recognised method of achieving and maintaining comparable national and global standards.
3. That each teaching institution must adjust the number of students according to its teaching capacity and the selection of students shall be in relation to the aptitudes required for a successful education in architecture, and this will be applied by means of an appropriate selection process at the point of entry into each academic programme.
4. That teacher/student numbers must reflect the design studio teaching methodology required to obtain the above capabilities as studio teaching should be a major part of the learning process.

5. That individual project work with direct teacher/student dialogue should form the basis of the learning period, continuous interaction between the practice and teaching of architecture must be encouraged and protected and design project work must be a synthesis of acquired knowledge and accompanying skills.

6. That the development of conventional drawing skills is still a requirement of the educational programme and modern personalised computer technology and the development of specialised software makes it imperative to teach the use of computers in all aspects of architectural education.

7 . That research and publication should be regarded as an inherent activity of architectural educators and may encompass applied methods and experiences in architectural practice, project work and construction methods, as well as academic disciplines.

8. That education establishments should create systems for self-evaluation and peer review conducted at regular intervals including in the review panel, appropriately experienced educators from other schools or other countries and practising architects, or participate in the approved UNESCO-UIA Validation System.

9 . That education should be formalised by an individual's demonstration of capabilities by the end of the programme of studies, the principal part being a presentation of an architectural project demonstrating the acquired knowledge and concomitant skills. For this purpose, juries should constitute an interdisciplinary team, including examiners external to the school who may be practitioners or academics from other schools or countries but who must have experience and expertise in the assessment process at that level.

10. That in order to benefit from the wide variety of teaching methods, including distance learning, exchange programmes for teachers, and students at advanced levels are desirable. Final projects could be shared among architecture schools as a means of facilitating comparison between results and self-evaluation of teaching establishments, through a system of international awards, exhibitions and publications on the internet web site. (UNESCO/ UIA, 2005).

Considering the charter, the studio environment, peer evaluation processes, adequate space for design processes, and juries are essential aspects of architectural studio education. Architectural design studios' "physical context has been recognized as an integral component to the profession's 'signature pedagogy' in which future architects embed cognitive and performative professional skills." (Grover & Wright, 2023, p.1174) However, the unexpected shift during the COVID-19 pandemic transformed design studios into online learning platforms and altered the ways they operate. The peer evaluation and in-person collaborations, as well as direct critiques from instructors and juries, had to adapt quickly to online platforms. Collective values, feedback, interactions, and practices, which together constitute the 'studio culture',

had to be transferred to the online tools. It can be stated that not only did the physical space change for the design students, but their social and emotional environment as well. In distance learning, the limitations of online platforms were insufficient to create a design studio space. In addition to these limitations, some students faced personal barriers, including limited access to digital resources, physical health constraints, and mental health difficulties. In response to these changes and limitations, this situation is examined in various contexts to understand its potential and shortcomings. Surveys conducted among architecture students provide valuable data to understand the nature of this shift. To this end, several surveys have been administered in Türkiye and internationally to examine the differences between the distance-learning studio environment and the physical design studio from students' perspectives. In this chapter, articles that include surveys from various regions around the world will be analyzed both individually and collectively to highlight commonalities and regional differences in students' experiences with distance architectural education, focusing on how design studio environments evolved during the COVID-19 as a result of distance learning.

The cases selected for analysis in this chapter are from different regions of the world. It was essential to look at the global scale, as documented in UNESCO's The Impact of COVID-19 on Higher Education Around the World. Analyzing survey findings from various regions provides a more comprehensive understanding of how architectural design education, with a studio focus, has been transformed globally. The selected papers are from various regions, including the United Kingdom, the United Arab Emirates, the United States of America, Malaysia, and Türkiye. The chosen papers were selected based on the similarity of their structure, such as including a survey of a specific student group that received both face-to-face and online education, and an analysis of the survey to provide a comprehensive view of the subject.

The article by Dahlia Nduom and Farhana Ferdous examines the challenges and opportunities of architectural design education during COVID-19 in the United States of America. 36 students across various levels of architectural education responded to the survey. (Nduom & Ferdous, 2021, p.377) The article, which examines the educational shift in the United Kingdom, aims to compare students' and lecturers' experiences, with particular attention to design studio education. In total, 798 students from various RIBA validated schools and 120 tutors responded to the survey. (Grover & Wright, 2023, p.1177) The article by Dana Khalid Amro examines the effects of

COVID-19 on architectural design education, focusing on the emotional impact on students in the United Arab Emirates. The case study was done with 140 first-year and 53 fourth-year students in the College of Fine Arts and Design. (Amro, 2022) The article written by Mervyn Hsin Jyi Wong, Mohd Afzan Bin Mohamed, Raja Nur Syaheeza Bin Raja Mohd Yazit, and Joanne Chui Ying Ho focuses on two Malaysian Universities. While the study focuses on challenges encountered in online education, it gives insight into students' perspectives in Malaysia on online learning systems. In total, 117 students answered the survey who are getting an education in either the University of Malaysia, Sarawak, or the University College of Technology Sarawak. (Mervyn Hsin et al, 2023) The research in Türkiye was conducted by Ebru Pekdaş and Burçin Kutsal. In total, 100 students from various universities in Türkiye attended the study. (Pekdaş & Kutsal,2021, p.5)

The diverse spectrum of contemporary architectural education systems on online platforms during the COVID-19 pandemic is analyzed globally within the survey-included articles. This chapter examines the details of each article and the surveys they discuss , and includes a comparative section that examines the cases as a whole.

3.1. Survey in the United States of America

Under the influence of emigrated Bauhaus instructors, the United States of America became one of the countries in which the ‘studio culture’ evolved most intensively. Therefore, “face-to-face instruction in the design studio setting has been the primary pedagogical system in architectural education” in the country. (Nduom & Ferdous, 2021, p.374)

> Some schools have previously explored hybrid models where online tools supplement the in-person design studio as a physical space of ideas. However, very few schools in a pre-COVID world have explored fully online architecture programs as a disruption from the physical studio setting. (Nduom & Ferdous, 2021, p.374)

Therefore, just like other countries, many schools, instructors, and students were not prepared for such a sudden change in the education system. The survey was conducted by Dahlia Nduom and Farhana Ferdous, who were instructors at Howard University. Thirty-six students participated in the survey; all were from Howard University, an HBCU (Historically Black College and University). The study also included questions specific to the HBCU University education systems. The communication methods

used by the students who attended the questionnaire were mostly Zoom, Blackboard, and Mural. (Nduom & Ferdous, 2021, p.377)

3.1.1. Studio Process

As shown in Figure 12, the challenges of distance education were at their peak in terms of mental health concerns and a lack of studio culture. In addition, studio engagement is the second most common concern among students.

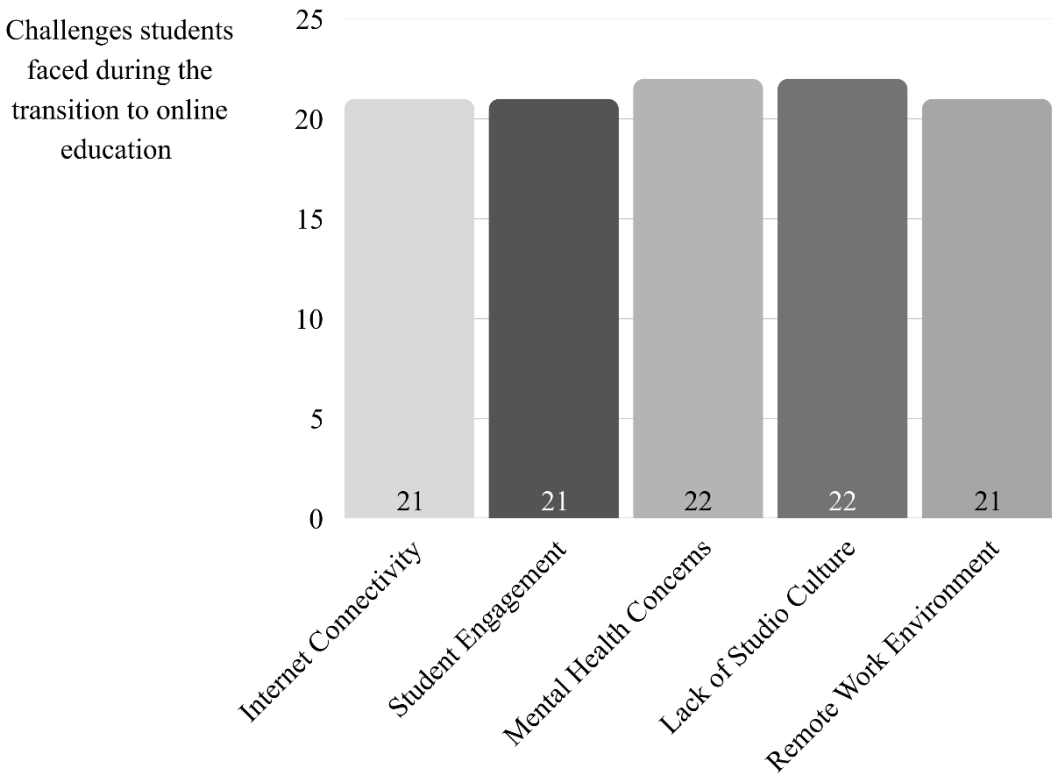


Figure 12.

Challenges students experienced during the transition to online education. The table is redrawn by the author. The original table is in Appendix A. (Nduom & Ferdous, 2021, p.379)

3.1.2. Peer Interaction

When students were asked about the positive aspects of online education, the most common response was guest critics from outside the city (Figure 13.). As a result of online education, students had the chance to meet new instructors, academicians, and architects. This connection broadened their perspectives and helped them to receive various critiques from professionals working in different fields of architecture. Fewer

than half of students saw student engagement as a positive impact and reported using innovative technology during online education. In addition, design flexibility was described as an essential aspect of the online education studio system.

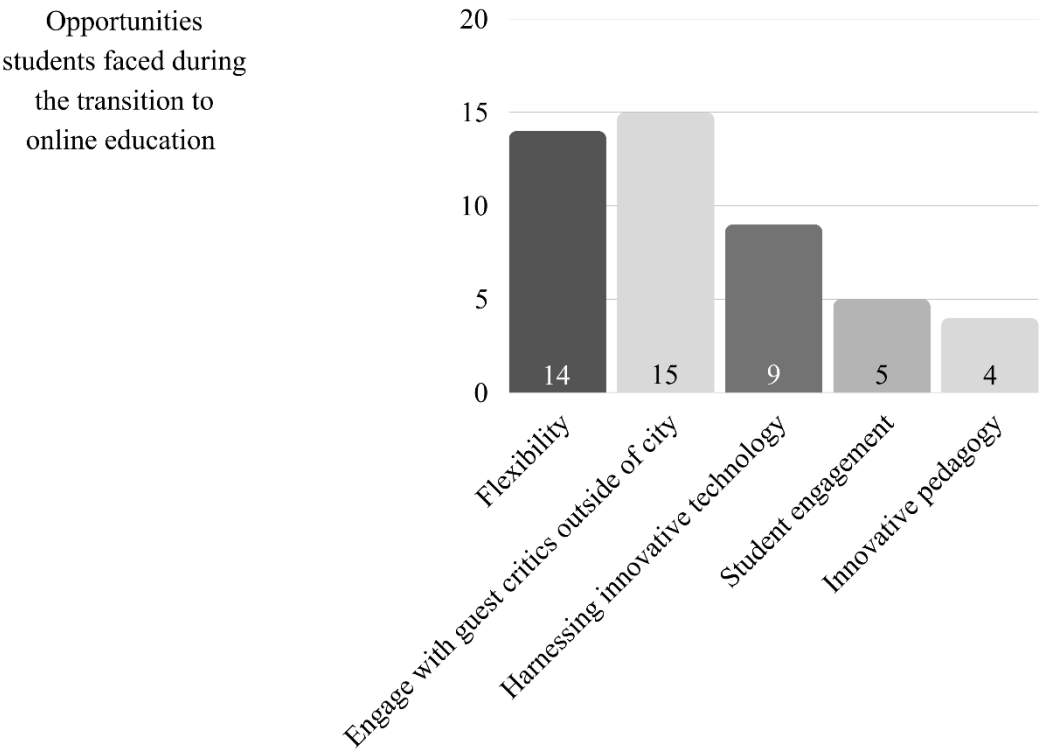


Figure 13.

Opportunities students experienced during the transition to online education. Table is re-drawn by the author. Original table is in the Appendix A. (Nduom & Ferdous, 2021, p.380)

The survey conducted by Dahlia Nduom and Farhana Ferdous comprised two parts, addressing both the positive and negative aspects of online education. The outcomes of the survey included loss of 'studio culture, mental health concerns, and the absence of peer interaction on the negative side. However, it also underlined the positive aspects, highlighting the importance of guest critics and flexibility in the work process.

3.2. Survey in the United Kingdom

The United Kingdom, one of the leading countries in architectural education, adopted online education more quickly than many others due to a robust educational infrastructure. The questionnaire, which exemplifies the conditions in the United

Kingdom, was conducted by instructors from the University of Bath's Department of Architecture and Civil Engineering, Robert Grover and Alexander Wright. However, the research was not limited to their institution; it included students from all RIBA-validated schools in the UK, ensuring that the outcomes are nationwide. In total, "798 students and 120 tutors from 29 UK universities responded to the survey." (Grover & Wright, 2023, p.1177) The survey was conducted online. The survey included multiple-choice and free-text responses, allowing applicants to write freely about advantages, disadvantages, and opportunities. (Grover & Wright, 2023, p.1177)

3.2.1. Studio Process

The first part of the survey included 'environment, types of learning activity, types of feedback, support, and learning from others.' and focused on the studio process during online design education. Students and instructors gave both multiple-choice and free-text answers to those questions. The online design studio was asked of the students in a free-text context. The students stated that their way of designing had changed and became harder due to the lack of physical space. (Figure 14.)

Student comments
"Online school is not the same. There is not the same connection between tutor and student. Harder to communicate ideas. IT IS NOT THE SAME." (1st year, Part 1 student)
"If working remotely for the next year is an option, I would definitely not chose it. Working at home has created new challenges such as boredom, dissatisfaction which drastically decreases motivation to work." (2nd year, Part 1 student)
"If there is remote learning next year I will be forced to take a year out. I don't have the resources to do the work to my best ability and I'm not getting enough support from the university" (2nd year, Part 1 student)
"Doing architecture cannot be done virtually, to practice architecture is to physically connect, create, discuss which cannot be imitated virtually. Nothing can replace the atmosphere of a review/ studio/ show where chance encounters between years and staff can take place." (3rd year, Part 1 student)
"I find it really concerning that remote working for architecture degrees may continue for longer than necessary. It works for lectures but definitely not for studio reviews and tutorials. The lack of contact with other students and tutors is a major disadvantage in my opinion. We students simply don't have the facilities or space at home to complete and architecture project.... Also working remotely with minimal contact with other students is a massive cause for concern particularly when regarding students' mental health (on top of the already existing issue of degrees of architecture's negative affect on mental health)." (1st year, Part 2 student)
"To stress, the studio as a physical space and the amenities that it comes with are CRUCIAL to my architectural education. Present standards of remote working have had a serious negative impact on my current and future architectural education…Communication and collaboration are critical conditions in Architecture, how is this supposed to be achieved in isolation?" (1st year, Part 2 student)
"I think studio culture is a massive thing from architecture students which isn't the same as people studying courses that are just lectures who may find remote working easier." (2nd year, Part 1 student)

Figure 14.

Representative quotes of the integral nature of the design studio to design education. (Grover & Wright, 2023, p.1183)

Overall satisfaction with the architectural studio in the online context was also assessed. The data chart below (Figure 15.) shows a decrease in satisfaction of students from the studio comparing distance learning and physical education. (Grover & Wright, 2023, p.1183) While 88% of students (including those who were very or fairly satisfied) were satisfied with in-studio face-to-face work, this proportion dropped sharply to 30% in distance learning. (Grover & Wright, 2023, p.1178)

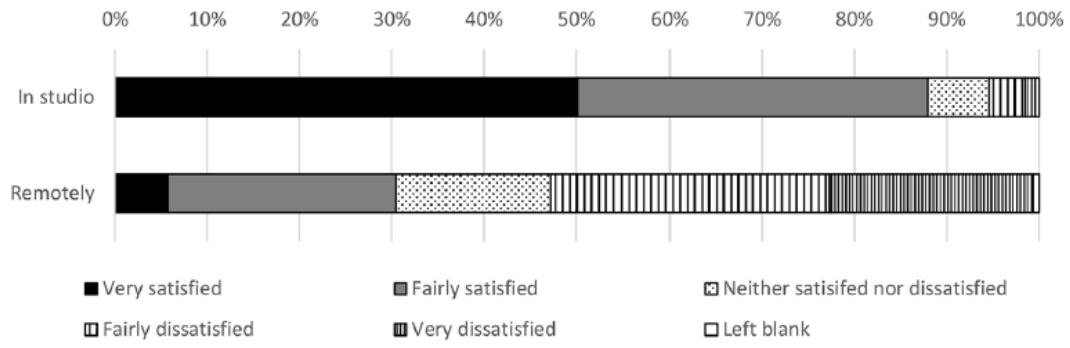


Figure 15.

Overall student satisfaction with the architectural studio and working remotely. (Grover & Wright, 2023, p.1182)

3.2.2. Peer Interaction

The second part included questions on 'student engagement, teaching facilitation, feedback, and assessment procedures, including questions about peers. The questions about peer learning were where significant changes were observed (Figure 16).

> The move to remote learning severed peer networks and support systems. Students described a lack of community, poor motivation and being unable to benchmark their progress. For example, total satisfaction with seeing the work of students in their year group fell by 72% following the move to online learning; the largest fall in any metric. These concerns were echoed by teaching staff. The loss of peer support networks also had impacts on student mental health and wellbeing; the move to remote studio teaching inducing a sense of isolation in many of the respondents. (Grover & Wright, 2023, p.1182)

The number of students who were 'very dissatisfied' increased radically. In the absence of peer evaluation and a collaborative work environment, students lacked motivation, which negatively affected the design process and, ultimately, the design project. The peer interaction was deeply affected by the online design studio, as can be seen in Figure 16.

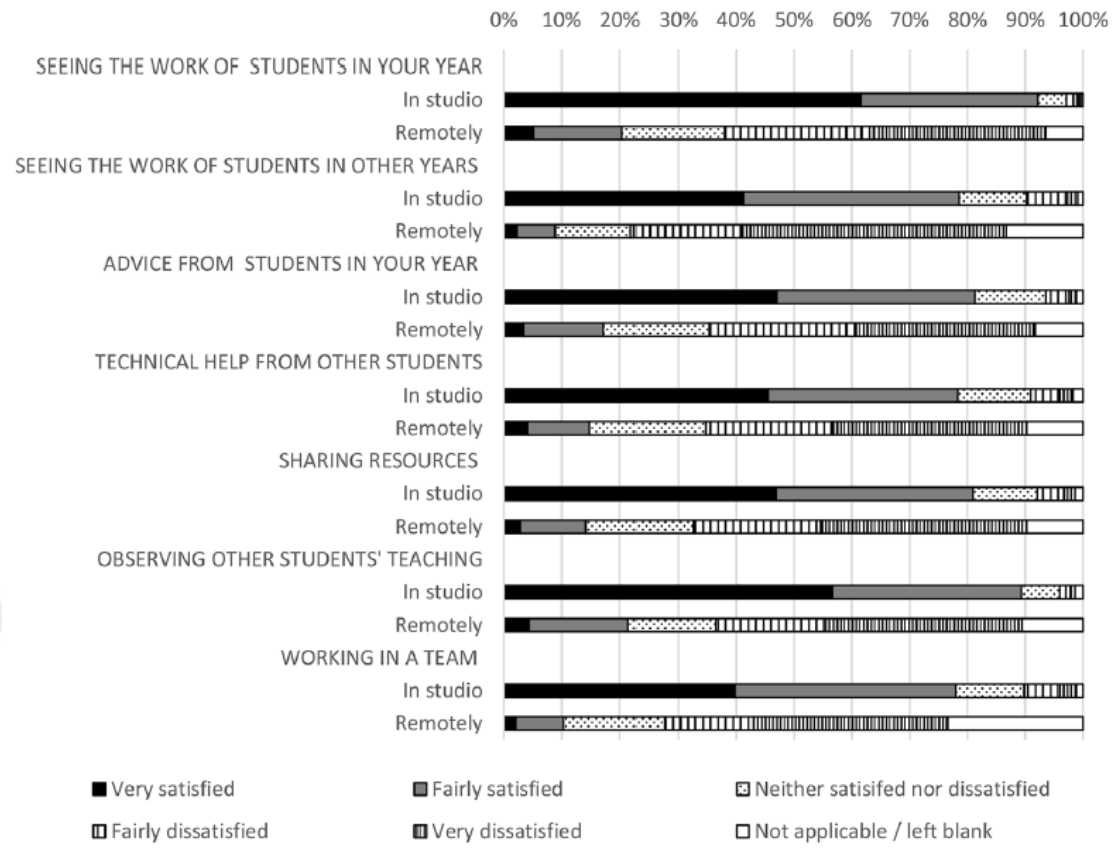


Figure 16.

Student satisfaction with peer learning in the architecture studio and working remotely. (Grover & Wright, 2023, p.1184)

When the answers to all questions are examined, it is seen that "while the removal of studios had an overwhelmingly negative impact on practical delivery of programs, it was the cultural, pastoral and communal aspects that were most keenly felt by staff and students." (Grover & Wright, 2023, p.1193) "The inability for students to learn from each other, seeing the work of others and sharing skills and knowledge, was directly challenged in a remote environment." (Grover & Wright, 2023, p.1193) It can be argued that the 'studio culture' was lost due to the limitations of distance learning. "The physical design studio enables immediate moral support, benchmarking, and peer learning that may be contributory factors to developing an effective studio culture." (Grover & Wright, 2023, p.1193) However, all these aspects of 'studio culture' were topics that students struggled with in the online learning environment.

3.3. Survey in the United Arab Emirates

As a global hub for education, when COVID-19 began, a shift occurred in education and design studies in United Arab Emirates. A questionnaire was administered by Dana Khalid Amro to examine how the shift occurred in the country and how it affected the students of the architectural studio. The questionnaire was an online survey that "included 193 design students, 140 first year and 53 fourth year students who are enrolled from the College of Fine Arts and Design." (Amro, 2022, p.108) The online architectural education in the College of Fine Arts and Design School was "delivered best by using platforms like Blackboard (BB) and Microsoft Teams (MT), which were frequently used for the creative design process and feedback. Instructors conducted an online class live, and all students joined at the same time." (Amro, 2022, p.114) "Most design courses considered synchronised classes with few asynchronised classes for more feedback." (Amro, 2022, p.114) "Online juries had been conducted to evaluate students' final performance." (Amro, 2022, p.114) "Instructors interacted with the students during the online class through several ways by using drawings on whiteboard, visual videos, audios and Flashback Pro recordings." (Amro, 2022, p.114)

3.3.1. Studio Process

The survey included the impact of the emotions of students during the COVID-19 pandemic on creativity and performance during the design process. (Figure 17.) (Amro, 2022, p.116) The quality of the learning during online education was 68.3% for first-grade students and 75% for fourth-grade students. According to the survey, while brainstorming was not much affected, finalizing the design process was affected for both first and fourth graders. While overall satisfaction with the online design education was 66.9% among first graders, preference was lower at 65.4%.

	Subjects	1st Year	4th Year
Motivation	Self-efficacy for learning & performance	83.5	82.7
	Self-regulation	87.1	82.7
	Enjoyment	68.9	69.1
	Task value	71.8	83.7
	Motivation	**80%**	**81.1%**
Effectiveness	Communication	76.8	76.9
	Organizing ideas	78.9	73.1
	Brainstorming	82.5	77.9
	Finalizing design project	64.7	69.3
	Time management	65.9	82.1
	Equal contribution	82.4	86.5
	Effectiveness	**73.6%**	**77.6%**
Learning	Perceived learning through online distance class	78.6	77.9
	Performance	73.6	71.2
	Quality	68.3	75
	Learning	**74.6%**	**79.5%**
Overall Satisfaction	Satisfaction	66.9	72.2
	Preference	65.4	69.2
	Satisfaction	**66.4%**	**71.25**
Overall percentage	**73.7%**	**76%**	

*All numbers are in percentage

Figure 17.

Summary of participants' perceived online distance learning experience and performance. (Amro, 2022, p.117)

3.3.2. Students' Overall Feelings

The other part of the survey by Dana Khalid Amro included mental health, emotions, and feelings related to COVID-19 and architectural education. (Amro, 2022, p.115-116) The survey is shown in Figure 18.

TABLE 3 Participants' feelings and emotions results during the design of their project in online distance class

	1st Year					4th year				
	5*	4	3	2	1	5*	4	3	2	1
Feel trouble relaxing when I work at online class	32.1	23.6	32.9	7.9	3.6	13.5	34.6	38.5	5.8	7.7
Apprehensive about enrolling in online class	15.7	32.9	35.7	7.1	8.6	9.6	32.7	40.4	7.7	9.6
Confused when I work on the internet	20.0	34.3	30.0	11.4	4.3	7.7	25.0	44.2	17.3	5.8
Anxious when I learn through online class	27.9	28.6	25.7	8.6	9.3	11.5	23.1	42.3	13.5	9.6
Feel worrying about working on my project at home	38.6	22.9	25.7	7.9	5.0	21.2	15.4	50.0	7.7	5.8
Get nervous when I am participating in online discussion	24.3	25.0	22.9	17.1	10.7	9.6	23.1	38.5	7.7	21.2
Have trouble in focusing during the online class	28.6	22.9	30.0	12.9	5.7	15.4	19.2	40.4	15.4	9.6
Face difficulties while working on my project	25.7	36.4	32.1	2.1	3.6	17.3	30.8	38.5	7.7	5.8
Feel nervous about my online performance	25.7	36.4	32.1	2.1	3.6	23.1	17.3	42.3	9.6	7.7
Lost interest in doing my assignments and project	31.4	25.7	27.1	10.7	5.0	25.0	23.1	38.5	9.6	3.8
Get nervous about getting lost in online class	29.3	30.0	22.9	9.3	8.6	19.2	21.2	44.2	9.6	5.8
Feel empowered in my online class	15.0	27.1	34.3	15.7	7.9	9.6	15.4	53.8	15.4	5.8
Got stressed while working on my project	42.1	31.4	20.0	2.1	4.3	28.8	11.5	50.0	7.7	1.9
Feeling afraid in finishing my project on time	41.4	26.4	24.3	6.4	1.4	28.8	13.5	42.3	11.5	3.8
Anxious when I think about logging into the online class	18.6	27.1	26.4	15.0	12.9	26.9	13.5	32.7	7.7	19.2
Total Average	**27.3**	**28.0**	**28.1**	**9.9**	**6.8**	**17.6**	**21.3**	**42.4**	**10.3**	**8.5**
Total percentage	**83.0%**					**81.3%**				
*Always=5	Often=4	Sometimes=3				Rarely=2	Never=1			
*All numbers are in percentage		Highest percentage					Second Highest percentage			

Figure 18.

Participants' feelings and emotions result from the design of their project in an online distance class. (Amro, 2022, p.115)

As shown in Figure 18, most students, both first graders and fourth graders, felt overwhelmed and nervous about the online delivery of the architectural studio course. 42.1% of the students stated that they always got stressed while working on their projects, and 41.4% students felt afraid of finishing their project on time.

Overall, Dana Khalid Amro's survey indicates that students who received online instruction during the COVID-19 pandemic reported negative feelings; however, this did not affect the outcomes of the architectural design studio, students' performance, or satisfaction with the studio.

3.4. Survey in Malaysia

Located in South Asia, according to UNICEF, which reported the most extended period of closed higher education institutes, Malaysia was a prominent country to be researched. (Mok & UNESCO, 2022) The article written by Mervyn Hsin Jyi Wong, Mohd Afzan Bin Mohamed, Raja Nur Syaheeza Bin Raja Mohd Yazit, and Joanne Chui Ying Ho "attempts to identify the challenges faced by architecture students, learning in an online studio environment during the COVID-19 pandemic." (Mervyn Hsin et al, 2023, p.81) After COVID-19 was announced in Malaysia, "The Ministry

of Education and the Department of Health has ordered the suspension of all academic activities to prevent the spread of the virus. For uninterrupted learning, the Ministry of Higher Education (MOHE) recommended that universities of higher education conduct classes online." (Mervyn Hsin et al, 2023, p.82) Therefore, all lessons and studio courses were suddenly migrated to the online system. 117 students completed the survey from the University of Malaysia, Sarawak, and the University College of Technology, Sarawak. The survey was administered via Google Forms. (Mervyn Hsin et al, 2023, p.84-85) The survey was not composed of different parts, but included direct questions such as the distance between students' houses and the city area, infrastructure, digital competency, efficiency in doing studio projects in the home environment, remote site analysis, and the difficulties in collecting data and students' perception of the effectiveness of online teaching.

3.4.1. Studio Process & Infrastructure

Since education completely migrated into an online system, one common problem among students was internet access. Therefore, students were asked how they evaluate their internet accessibility.

> Sarawak despite being the largest state in the country, has most of its rural areas unequipped with the infrastructure needed to support better Internet accessibility. This has then become one of the main obstacles for online learning, as students may disconnect during virtual tutorial sessions or be unable to upload submissions on time. (Mervyn Hsin et al, 2023, p.85-86)

As shown in Figure 19, nearly 30% of the students reported internet problems and rated the question as poor or fair.

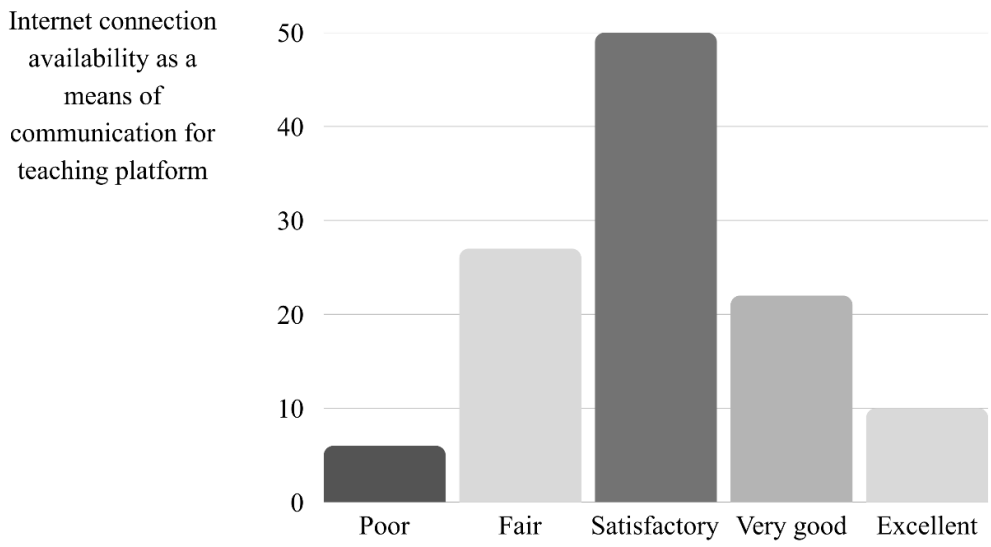


Figure 19.

Students' evaluation of internet accessibility. Table re-drawn by the author. (Mervyn Hsin et al, 2023, p.86)

Students who have experienced connection issues require a private design critique session, which would be an issue between the lecturers and students, since some students needed to watch the pre-recorded critique sessions.

When asked about the efficiency of the online design studio, nearly 60% of the students rated it poor or fair. (Figure 20.) Fewer than 5% of students in Malaysia found online design education effective.

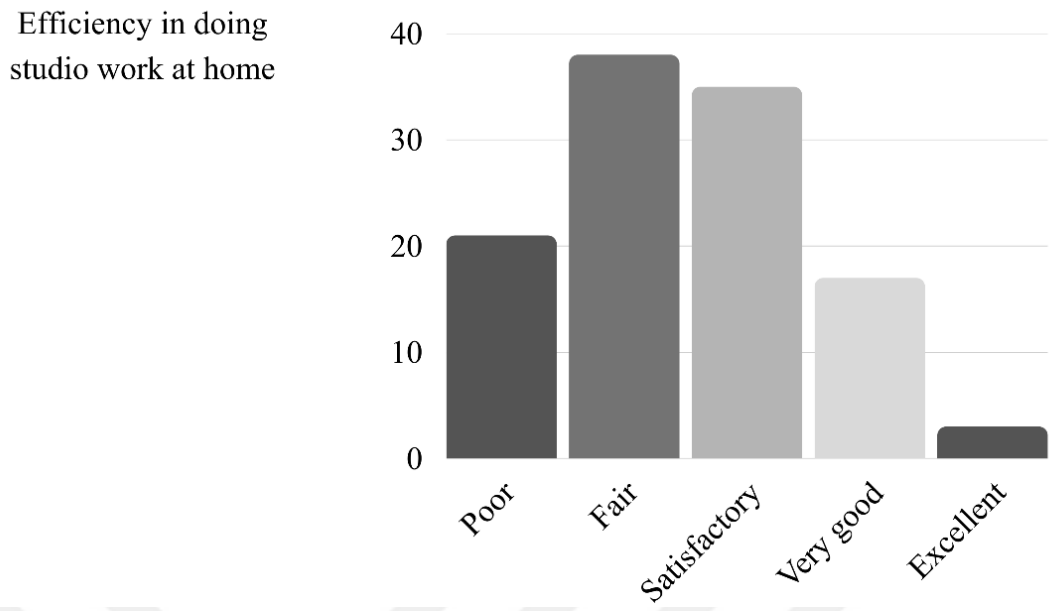


Figure 20.

Efficiency in doing studio work at home. Table re-drawn by the author. (Mervyn Hsin et al, 2023, p.88)

3.4.2. Students' Perception of the Effectiveness of Online Teaching

When examining students' overall perceptions, the challenges and opportunities are intertwined. "A total of 81.1% of the students preferred a conventional in-person design studio compared to the virtual alternative." (Figure 21.) (Mervyn Hsin et al, 2023, p.89) The challenges students reported in the survey included internet problems, lack of interaction, miscommunication, stress, burnout from being on screen for longer hours, and lack of motivation. (Mervyn Hsin et al, 2023, p.89) Therefore, they tended to prefer the traditional face-to-face studio over an online environment.

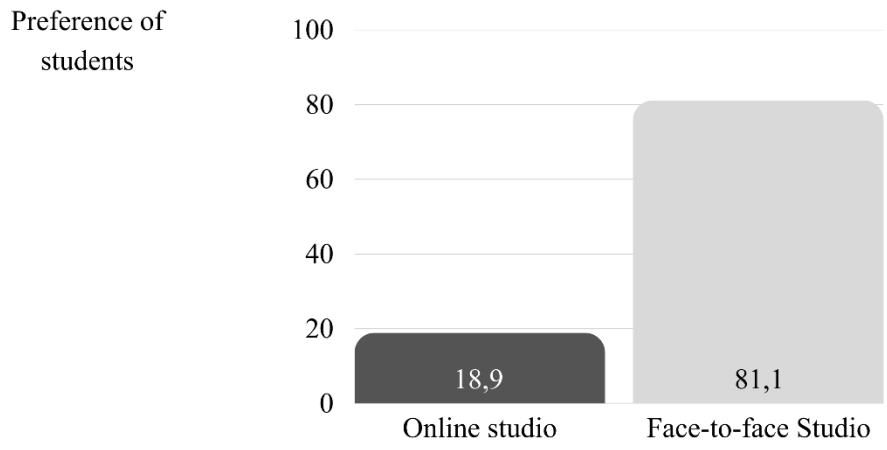


Figure 21.

Students' preference for architecture design studio. Table re-drawn by the author. (Mervyn Hsin et al, 2023, p.88)

To conclude, in Malaysia, where higher education institutions were closed for extended periods, students faced numerous challenges. Miscommunication, internet connectivity issues, burnout, chronic stress, and geographic constraints were among the challenges they faced during the COVID-19 pandemic. When students evaluated the whole process, they preferred the face-to-face studio over the online studio.

3.5. Survey in Türkiye

When the COVID-19 pandemic began in March 2020, Türkiye, like many other countries, experienced a rapid transformation of the education system. On 13th of March 2020, the Council of Higher Education (Yüksek Öğretim Kurumu – Y.Ö.K.) sent an announcement letter to all universities in Türkiye that explained they had decided to give a three-week break to education, starting from 16th of March 2020. (Yükseköğretim Kurumu, 2020) On the 19th of March, Y.Ö.K. sent another detailed announcement on the topic of "Education and training processes during the novel coronavirus disease outbreak". (Yükseköğretim Kurumu, 2020) According to the announcement:

1. The theoretical parts of courses in higher education programs at all levels can be conducted through distance learning, if necessary infrastructure and competence are available; practical parts of the courses may be provided at appropriate times, based on a condensed academic calendar tailored to each program.

2. The principles to be observed regarding distance learning activities to be conducted by higher education institutions as a substitute for formal education, "limited to the spring semester of the 2019-2020 academic year," are set out below:

> Higher education institutions may continue their education and training activities at the associate, undergraduate, and graduate levels in formal education through distance learning, based on their program diversity and infrastructure capabilities, with the decision of their authorized boards, and with measures and regulations to be taken, taking into account their quality. Higher education institutions may use distance learning methods, either synchronous or asynchronous, in all courses within their formal education programs. (Yükseköğretim Kurumu, 2020)

With this notification from the Y.Ö.K., universities had to adapt themselves to the new online distance education system. This new system is analyzed using a questionnaire administered by Ebru Pekdaş and Burçin Kutsal, who were instructors at the Toros University Faculty of Fine Arts, Design and Architecture. It was a questionnaire completed by 100 students from different state universities in Türkiye. (Pekdaş & Kutsal, 2021) The questionnaire was administered online via Google Forms and consisted of two parts. The first part of the survey included one free-text question and 8 multiple-choice questions; the second part included 19 questions. (Pekdaş & Kutsal, 2021, p.5)

In Türkiye, online education at state universities was divided into two modes: synchronous and asynchronous. (Pekdaş & Kutsal, 2021, p.5) Synchronous education involved online meetings held simultaneously via platforms such as Google Meet, Zoom, and Microsoft Teams. However, asynchronous education included online instructor feedback sent directly to students via email, as well as pre-recorded videos. (Pekdaş & Kutsal, 2021, p.8)

3.5.1. Studio Process

In the second part of the survey, questions were asked to assess the design studio's efficiency. The most inclusive question was the statement ‘Distance Learning is more effective than face-to-face education for architectural design education,’ as shown in Figure 22.

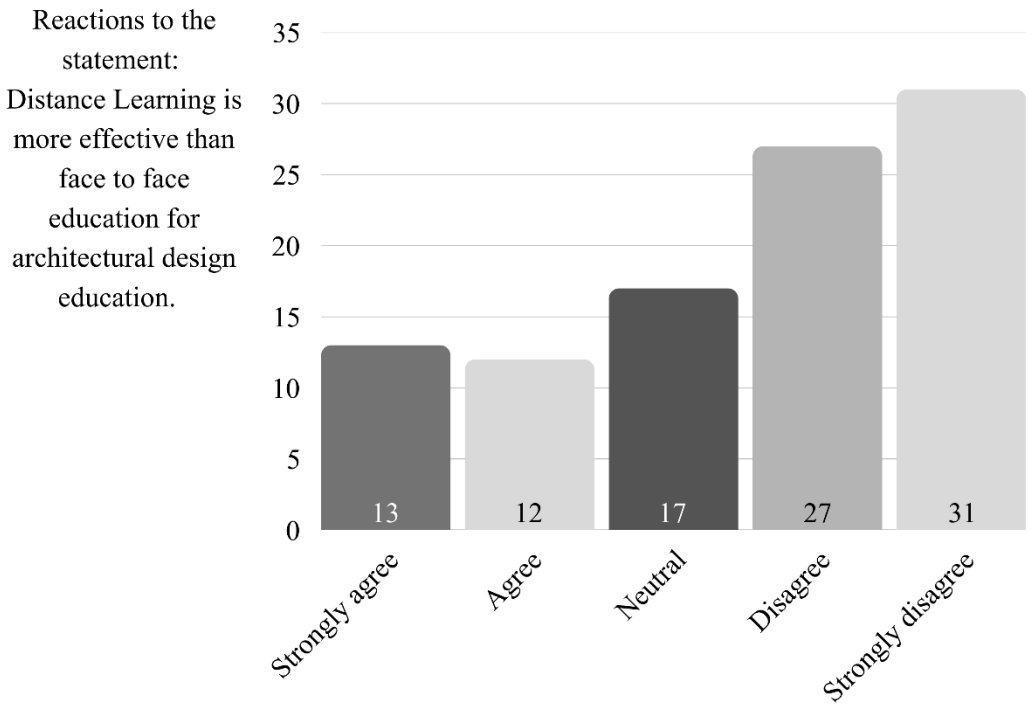


Figure 22.

Answers to the statement: Distance Learning is more effective than face to face education for architectural design education. Table re-drawn and translated by the author. (Pekdaş & Kutsal, 2021, p.10)

As shown in the chart above (Figure 22), 58 of 100 students did not agree that distance learning is more effective than face-to-face education in Türkiye. However, students also included that they tried to learn new ways of representing and modelling by learning new programs since there was no suitable environment for model-making. (Pekdaş & Kutsal, 2021, p.8) Therefore, distance learning can be seen as having a positive effect on learning new ways of representing and enhancing their understanding of the topic.

3.5.2. Peer Interaction

This rapid change in the education system and infrastructure limitations affected students primarily through peer feedback. One of the most crucial questions of the survey was 'I examined and was aware of the peer works during the distance education.' As shown in Figure 23, 32 students strongly disagreed with this quotation, and 27 disagreed.

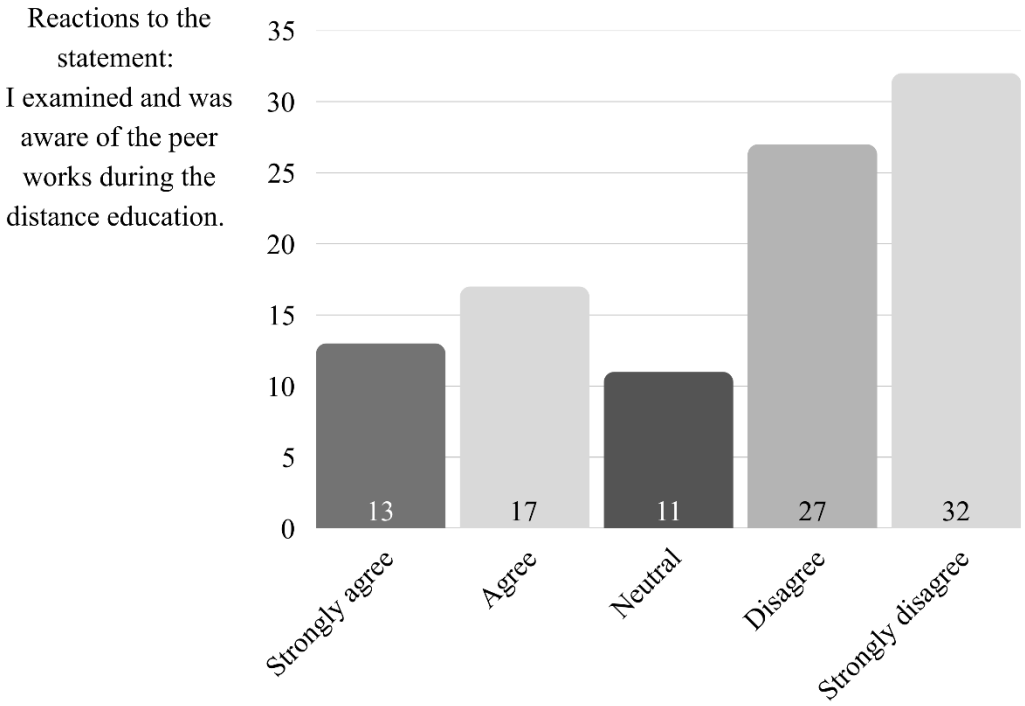


Figure 23.

Answers to the statement: I examined and was aware of the peer work during the distance education. Table re-drawn and translated by the author. (Pekdaş & Kutsal, 2021, p.10)

Most of the participants of the questionnaire conducted by Pekdaş and Kutsal had an asynchronous online education. In light of the survey, as a concluding remark, it can be stated that this asynchronous education system led to a decline in studio culture, limited students, and diminished their ability to design. The most common part of this lack was through peer working and peer evaluation. Since the students lacked this interaction, their satisfaction with the design process and design studio decreased.

3.6. Comparative Analysis of the Questionnaires

When analyzed together, the articles that discuss questionnaires administered in the United States, the United Kingdom, the United Arab Emirates, Malaysia, and Türkiye yield similar outcomes, with some regional differences and infrastructural limitations. The COVID-19 pandemic had a profound impact on design studios and on our lives. The way students design, the software they use, and the way they design have changed entirely. According to UNESCO's Charter for Architectural Education, peer work and

review, the studio environment during the design process, and juries are essential components of a design studio. (UNESCO/ UIA, 2005) Since these are also components of a contemporary studio in a worldwide context, surveys from the different areas included questions directly related to the main aspects of a contemporary studio. All surveys from various parts of the world reveal that students who received distance learning instead of a face-to-face design studio environment were dissatisfied with the design process and felt there was a lack of peer support and collaboration, which are fundamental principles of a design studio. Lack of peer evaluation and peer work led students into an unsatisfactory period of design development. In addition, studio culture was another common theme in the questionnaires. Studio culture, which included juries, peer feedback, peer work, interaction, critique, and experimentation, slowly decreased. Because 'studio culture' was not primarily about the product, but it was the culture that included the process of design in a social and emotional environment. Without a social and emotional environment, architecture students struggle to engage in effective design processes, as evidenced by questionnaires from various parts of the world discussed in this chapter. Infrastructural limitations were common across all surveys; however, the percentages of students who encountered them varied by country. Since institutions in the United Kingdom and the United States of America sometimes conducted hybrid lectures, they adapted more quickly than institutions in other countries; however, students still faced difficulties with technical capabilities. All of these main issues were identified in the surveys and led to student dissatisfaction.

These surveys also included approaches to conducting online education and the development of new systems for each country. In some countries, such as the United Kingdom and the United States of America, institutions preferred to deliver lectures synchronously, whereas in others they used a hybrid or asynchronous model.

In addition to the adverse effects, surveys identified the positive aspects of online design studio education. While Turkish students viewed online education as a way to learn new forms of representation, American students saw it as an opportunity to receive various critiques from guest instructors. The Arab students perceived it as a time for self-efficacy and found it easier to manage their time.

In the following chapter, the differences between online and face-to-face design studios will be investigated. The analysis will explore the design processes specifically from TED University, Department of Architecture, in the 2020-2021 academic year, during distance education, through a discussion of the responses to an online questionnaire administered by the author to her peer students. This investigation examines the impact of the studio environment on both design processes and end products across different years of study, using data from distance and face-to-face learning experiences.

CHAPTER 4
THE EFFECTS OF THE STUDIO ENVIRONMENT ON ARCHITECTURAL DESIGN EDUCATION

The previous chapter examined articles that are discussing the findings of questionnaires administered in various regions worldwide. To examine the effects of the COVID-19 pandemic on architectural design education, the author conducted a questionnaire at TED University among students who studied there during the pandemic.

This chapter discusses the responses to the questionnaire and interprets the outcomes in relation to online architectural studio education during the COVID-19 pandemic worldwide.

The survey respondents were third-year students at TED University during 2020 – 2021 who had online education throughout the year. Third-year students were selected to enable a balanced evaluation and comparison between face-to-face and online design education. These students received face-to-face education in their first and second years of study. After the first semester of their second year, they also completed one semester of online design education, followed by a fully online third year consisting of two semesters. Therefore, the students in the 2022 class received nearly an equal amount of online and face-to-face design education. They have already participated in some group work in face-to-face and online design education. For these reasons, third-year students were selected as the research group for the survey.

The sudden break in education caused a rapid change in the education system. TED University started its education with an email by the rector herself that informed students and lecturers as follows:

> Dear Students,
>
> In order to continue education at the University, which was suspended due to Coronavirus pandemic, theoretical parts of the courses will start to be given through distance education as of March 23rd, 2020 Monday. Distance education will be implemented via Zoom application as an integrated part of Moodle where you will be able to connect simultaneously. A detailed information on the process will be sent to you via e-mail by the Department of Information Technology.

> You will also be informed later on how practical courses (studio, laboratory, etc.) and exams will be held in the process.
>
> Please keep away from crowded places and stay home in order to get through this difficult period as soon as possible.
>
> Warm regards,
>
> Prof. Dr. Belgin Ayvaşık
>
> Rector (B. Ayvaşık, personal communication, 19 March,2020)

The following email included a detailed framework of online education at the TED University:

> Dear TEDU Students,
>
> Due to COVID-19 pandemic theoretical parts of all courses within TEDU will be carried out through distance education as of March 23rd, 2020. Zoom Video Conferencing System integrated with our current Moodle Learning Management System will be used as tools for distance education.
>
> First of all, all our students are advised to download (https://zoom.us/download) Zoom application to their desktops and mobile devices for a better performance. Users that has not downloaded Zoom app will still be able to access courses through up-to-date web browsers.
>
> Students will not be required to create Zoom accounts and online courses can be accessed through Moodle with their Moodle accounts. Please follow the steps that are described on https://remote.tedu.edu.tr/tr/remote/participate-online-classes website to participate online courses within Moodle.
>
> Due to the expected workload on our Moodle Learning Management System, we have planned to host Moodle courses on 2 separate servers.
>
> Courses that start with course codes TUR, ENG, HIST, LIT, ART, BIO, MATH, PSY and ELS courses can be accessed by all faculty members and students with the same user name and passwords through https://moodle2.tedu.edu.tr link.
>
> All other courses will still be accessible from current Moodle server (http://moodle.tedu.edu.tr).
>
> Do not take risk, do what is required. Follow 14 rules against the Corona Virus risk.
>
> Regards,
>
> Department of Information Technologies (U. Rodoplu, personal communication, 19 March, 2020)

Within this framework, TED University's architectural education department included synchronous instruction in the design studio. Online studio education at TED University employed various modes of instruction. The studios were held on 2 days

per week, from 09.00 to 15.00, as usual. However, students and professors used Zoom to create a uniform studio environment. Both the students and the instructors joined Zoom simultaneously, creating an online studio. The Zoom platform enabled instructors to provide critiques directly on the projects displayed on the screen. (Figure 24) As it was done in a face-to-face studio, towards the end of the studio, for every student to get critique regularly, instructors created groups consisting of 7-8 students. Therefore, one instructor could give a critique to every student, helping them increase their design speed. This method was conducted on the 'Zoom' platform with subdivisions called 'rooms'. Students were asked to enter the room assigned to them for a critique. However, after their studio time, when they received their own critique, they were able to switch to another room to listen to the critique they had wanted.

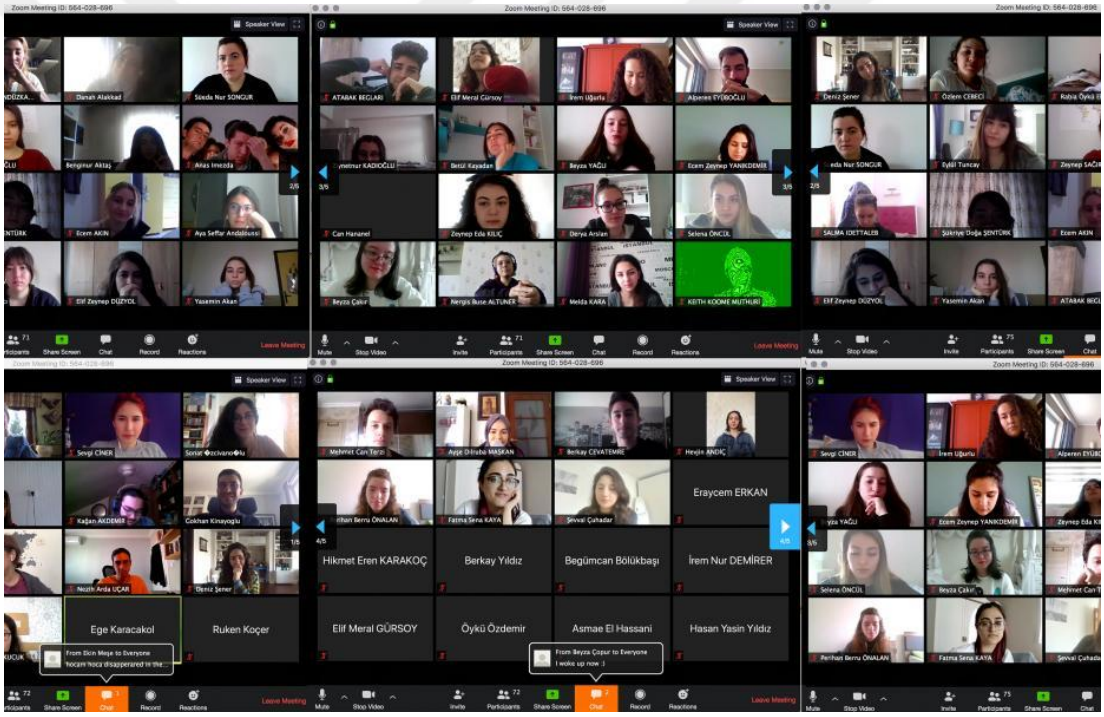


Figure 24.

Virtual studio environment at TED University. (Department of Architecture | TED Üniversitesi, 2026)

Studio sessions were recorded, and the video files were uploaded to a system so that students who were ill or had internet access issues could reach out. The studio juries were also online. Either in groups or individually, participants would turn on their cameras and present their projects to both the studio and the jury. The critiques of these juries would be held again on Zoom, with all members of the studio, students, jury members, and instructors attending. Presentations changed format and were formatted

so they were easier to present on a screen rather than on a large collective sheet, generally printed in A0 format. In addition to studio lectures, online learning provided students with the opportunity to learn more by interacting with guests from different parts of the world. Organized by the instructors and the architectural design community at TED University, the events featured architects from around the world who delivered lectures on their profession and interests. So that students can gain more knowledge from professionals around the world in their fields.

With online education, the notion of site visits has also changed. Site visits had to be conducted over systems like 'Google Earth', 'Yandex Maps', and online libraries that hold the information of the place. At TED University during the 2020 – 2021 academic year, 3rd-year students were assigned to work on Venice. Venice was specifically chosen by the faculty members for its large amount of information already available on online platforms. The first semester's project name was 'CUS University Sports Club,' and the project was located in Dorsoduro, Venice. The instructors for the project were Can Aker, Esatcan Coşkun, Melis Acar, Namık Erkal, Onur Yüncü, Sinem Çınar. Some of the chosen projects can be seen in figure 25.

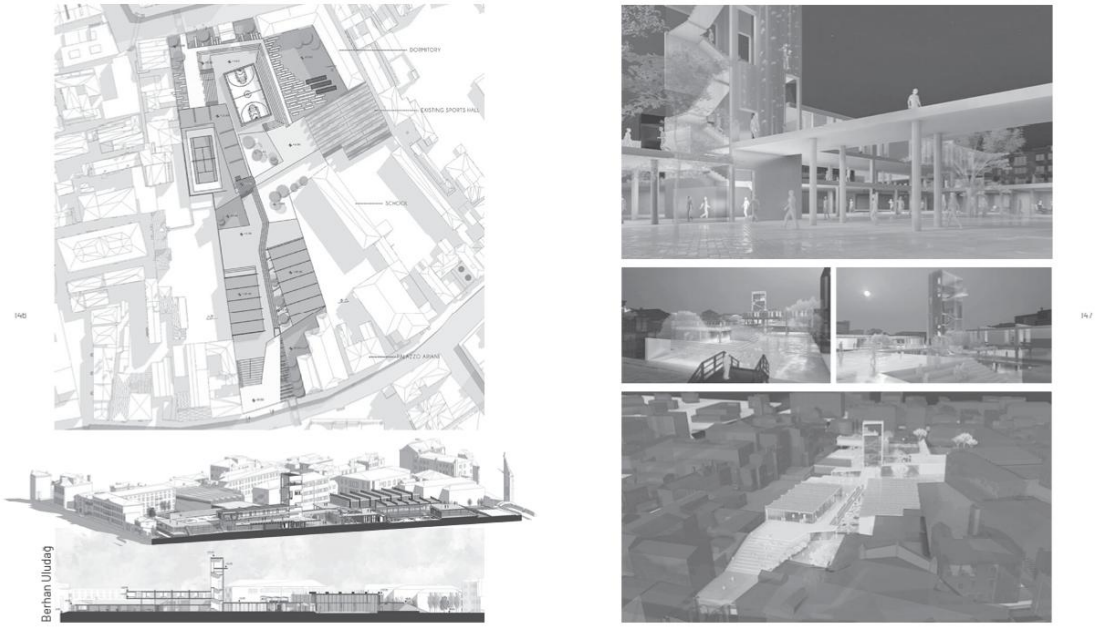


Figure 25.

Workbook - Berhan Uludağ's work for the Arch301 online studio course at TED University, Fall semester 2020. (Tüntaş et al., 2022)

The second-semester project was in Ankara, so the necessary information could be provided directly by the municipality. Since TEDU was located in Ankara, every student had a general knowledge of the site and the province. The project's name was 'Urban Housing in Ankara'. Instructors of the studio were Azize Elif Yabacı, Can Aker, Esatcan Coşkun, Melis Acar, Namık Erkal and Onur Yüncü. It was asked to design an urban housing complex in Ankara, as can be seen in Figure 26.

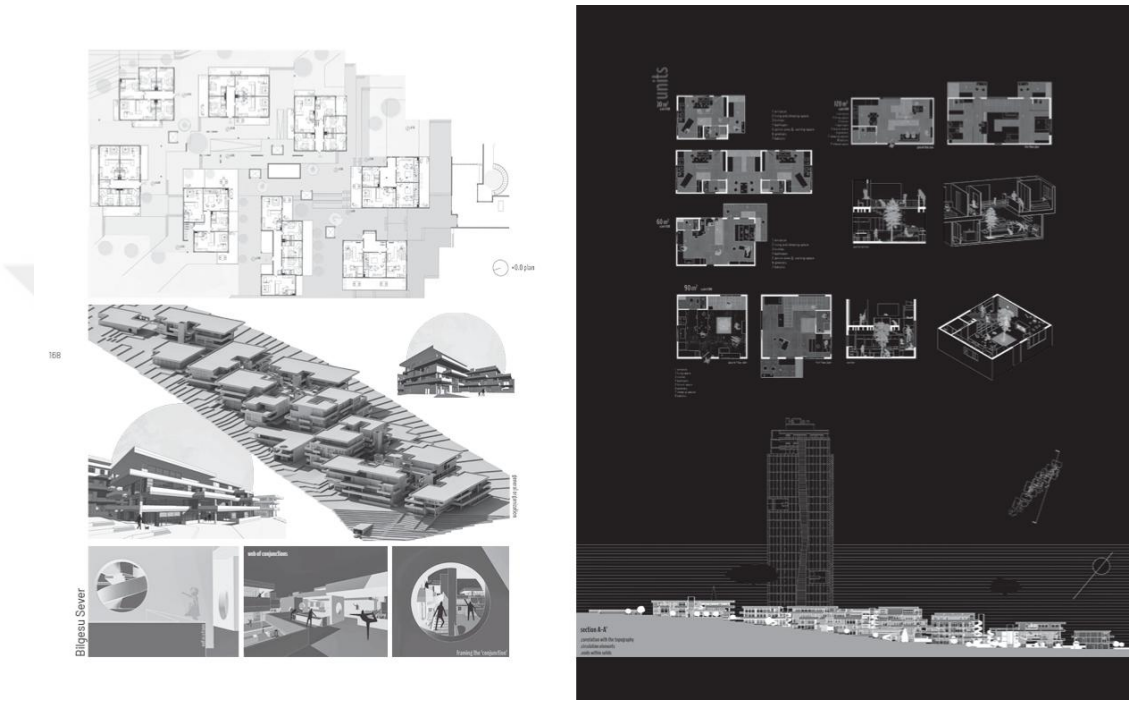


Figure 26.

Workbook – Bilgesu Sever's work for the Arch302 studio course at TED University, Spring semester, 2021. (Tüntaş et al., 2022)

Since the students who received distance education have now graduated and are working worldwide, the research methodology for the questionnaire was internet-based. The questionnaire was hosted on Google Forms. Only the students who got an online studio at TED University answered the questions. The survey was sent to 76 people, and 21 students responded. It included five main sections: Studio Processes, Online Group Works, Peers, Products of Distance Education, and Overall Evaluation of Students. The main sections of the survey were classified according to the core conditions of an architectural institution emphasized in the UNESCO/UIA Charter for architectural education. The survey structure is organized into these chapters, which outline the requirements of an accredited architectural education institution for

tracking gaps and strengths in architectural design education during the transition to online learning. The first section, studio processes, explores changes in the studio method, lecturer–student dialogue, and the physical studio space. The online group works, and peer sections examine collaboration and communication among peers during the design process, and how the network affects it in the online study environment. The products of the distance education section investigate students' acquired knowledge, skills, and abilities, with a focus on their transition during the COVID-19 pandemic. In the last section, the overall evaluation of students is asked to explore the entire online education system and to examine students' perceptions. There were 22 questions in total, comprising multiple-choice and open-ended items, to elicit both quantitative and qualitative data from the students. Multiple-choice questions used a Likert scale with statements such as strongly agree, agree, neutral, disagree, and strongly disagree to understand students' emotions, attitudes, and perceptions. As Likert stated, "…the 1 to 5 method has the additional advantage over the sigma method … get a more reliable measure of the student's attitude." (Likert, 1932, p.26) Therefore, to make a better evaluation, including students' ideas from multiple-choice questions, the Likert scale is used.

The questionnaire aimed to examine how the transition to distance education affected students, studio culture, peer communication, and, ultimately, the design process. It explores how the lack of physical space in the design studio affects creativity, collaboration, discussions, and the feedback process of the students in light of the answers of the students. Through students' responses, the study provides insight into the long-term impacts of online studio education, creating a broader and more recent view of online architectural education under the COVID-19 pandemic.

4.1. Studio Processes

The first section of the survey contained questions about 'Studio Process'. It analyses students' perceptions and experiences of the studio and the studio process in architectural education, focusing on the shift from traditional face-to-face studios to online studios during the COVID-19 pandemic. The studio process, including the physical studio, design development, critique sessions, feedback sessions, and peer interaction, has been foundational to architecture education. These did not merely create a mode of instruction; they also shaped the studio culture. This section of the survey seeks to reveal the dynamics of the studio in the new online environment to the

students. Each question explores a specific studio practice, both technical and theoretical. There are 8 questions about the studio process, one of which is open-ended. Answers explore how the studio's pedagogical essence was preserved and adapted into the new online context from the students' perspective.

The first question was "Do you think having two days of online studio courses per week was sufficient?" At TED University, studio lectures are two full-day courses, one on Tuesday and the other on Friday. This did not change in online education; however, some students may have needed more online lectures. Therefore, this question should be the first to ask students. The majority of students (16 of 21; 76.2%) agreed that the number of online studio hours per week was sufficient (Figure 27).

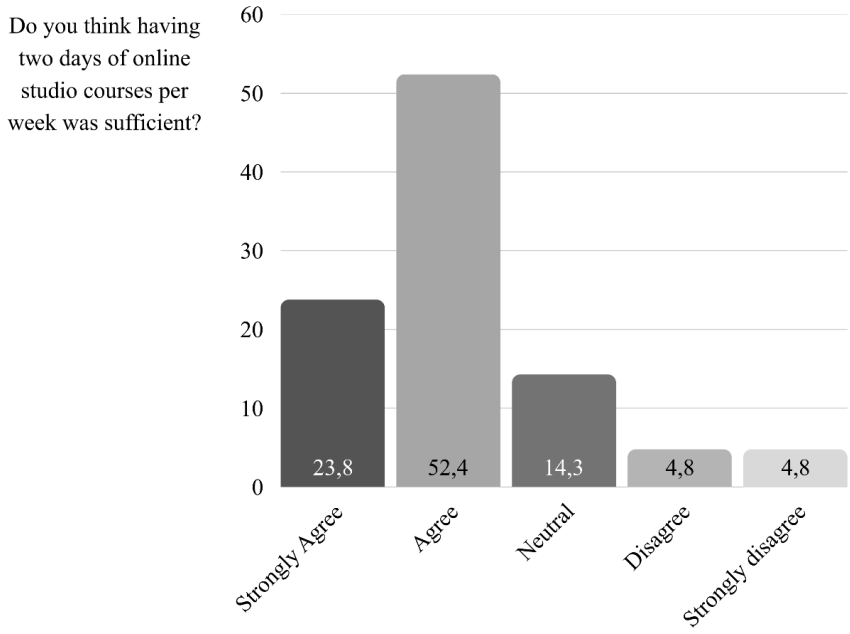


Figure 27.

Answers to the question: Do you think having two days of online studio courses per week was sufficient? Table drawn by the author.

This indicates that the studio hours were still sufficient for students to maintain a healthy design process and the studio's structure. However, 9.6% of students disagreed with the statement, preferring additional lectures or longer online learning periods.

The second question was "Do you think the duration of the online studio courses was sufficient for receiving critiques and developing your project?" This question was a follow-up to the first question, designed to identify the reasons for those who disagreed.

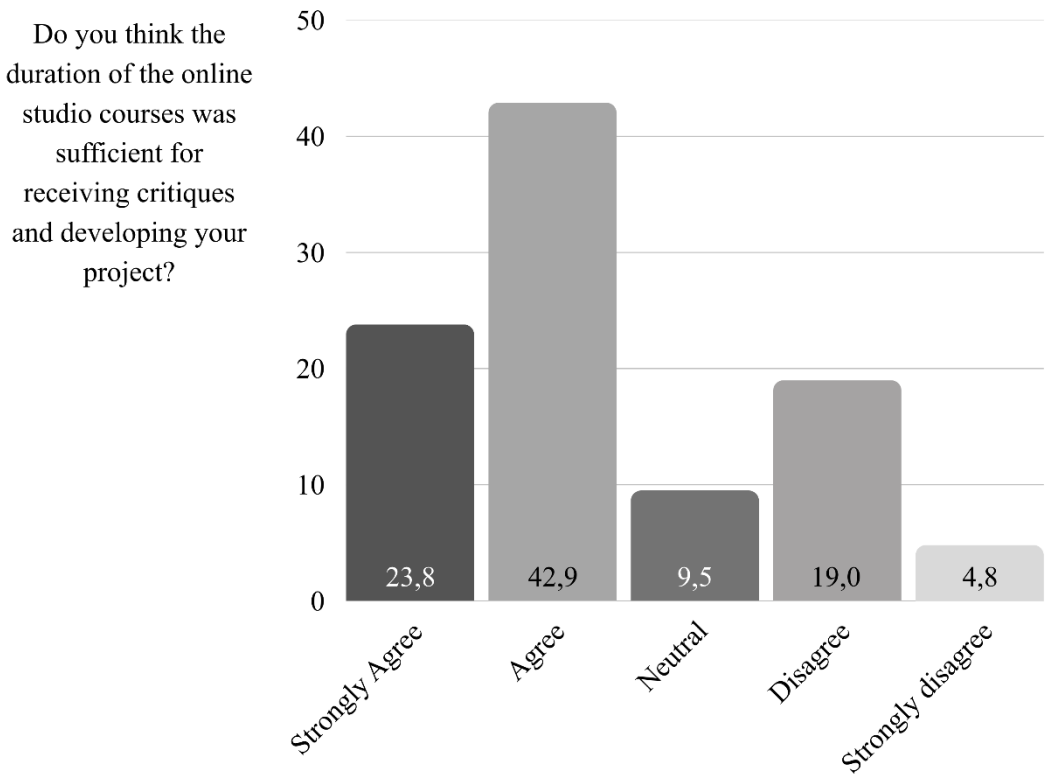


Figure 28.

Answers to the question: Do you think the duration of the online studio courses was sufficient for receiving critiques and developing your project? Table drawn by the author.

While 66.7% of students agreed, the disagree and strongly disagree responses accounted for 23.8% of responses. Thus, there is an almost 10% decrease in agreements and an almost 15% increase in disagreements compared to the first question. The answers (Figure 28) showed that although the studio hours were sufficient for many students, the duration of feedback and critiques varied widely, creating mixed experiences for students.

The third question asked was “Were you satisfied with the content of the studio?” Most students (71.4%) agreed that the content was sufficient (Figure 29). The answers indicate that, despite the transition to the online studio, the studio's content did not lower its standards for most students. The studio content includes both theoretical background and hands-on design exploration. Although the hands-on component decreased due to limited physical studio space, most students found the content rich. It can be stated that new ways of delivering content and new methods of study, such

as online research and site visits via Google Maps, have enhanced the studio's content and filled the gap.

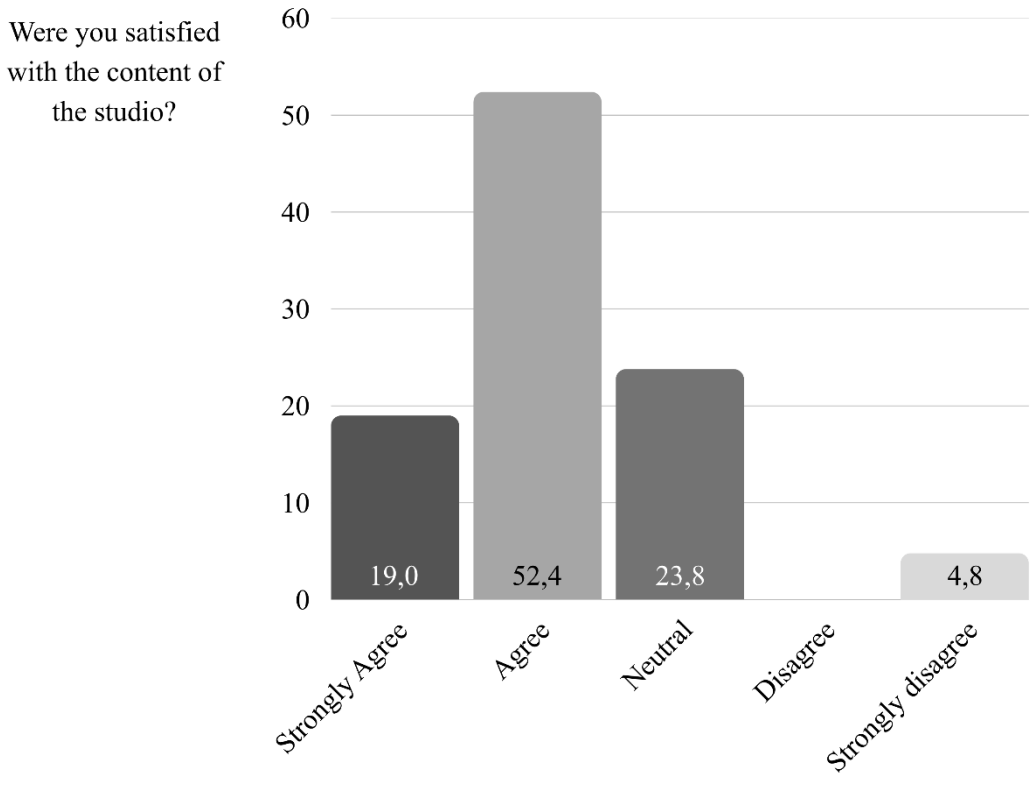


Figure 29.

Answers to the question: Were you satisfied with the content of the studio? Table drawn by the author.

The fourth question was “Were you satisfied with the format of the studio?” The studio's online education format was primarily synchronous via Zoom. Students were to join the Zoom at the studio's scheduled delivery time, turn on their cameras, and actively listen to the critiques. Additional lecture notes were to be uploaded to the Moodle (LMS) system so students could access them whenever needed. The person who wanted to receive a critique and present their work used to share their screen, and, aside from that, no additional input from the Moodle system was provided. 61,9% of the students reported being satisfied with the studio format. Despite the limitations of online platforms and a lack of studio culture, more than half of participants rated it sufficient, and 19.1% disagreed with the question, as shown in Figure 30.

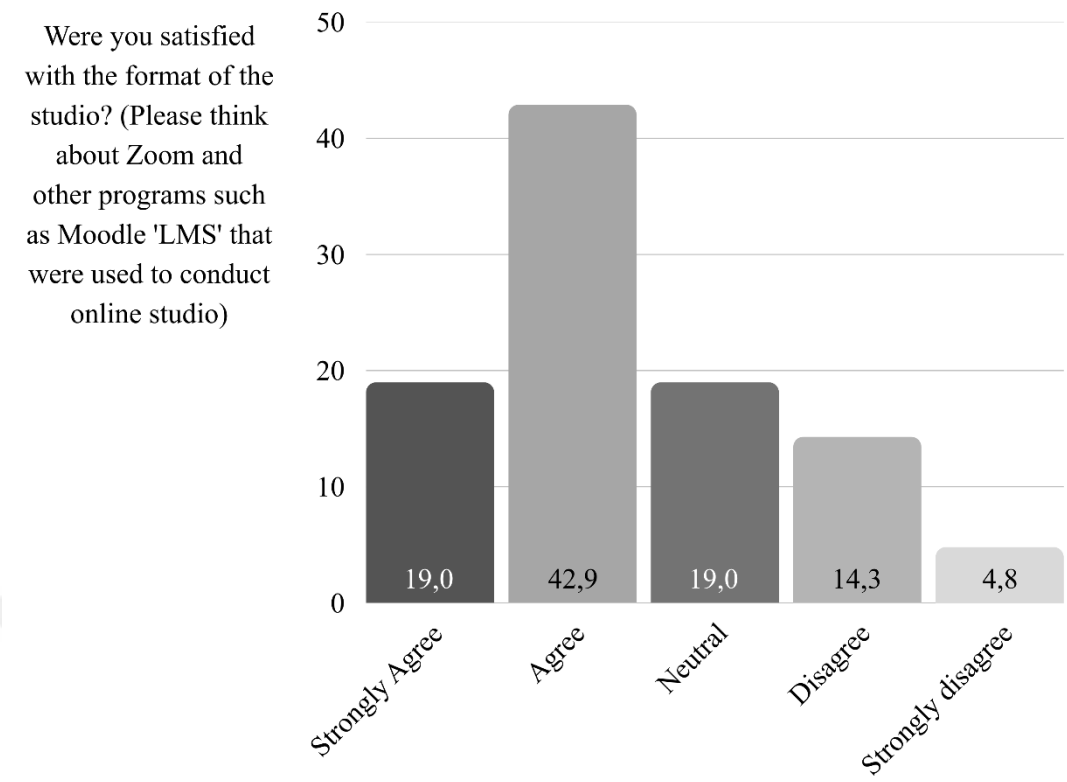


Figure 30.

Answers to the question: Were you satisfied with the format of the studio? Table drawn by the author.

The fifth question about the studio was, “Do you think the amount of feedback time provided by studio professors was sufficient for the design phase?” The majority of students (76.2%) agreed with the statement, indicating that the time spent in critique sessions was sufficient for most students. (Figure 31)

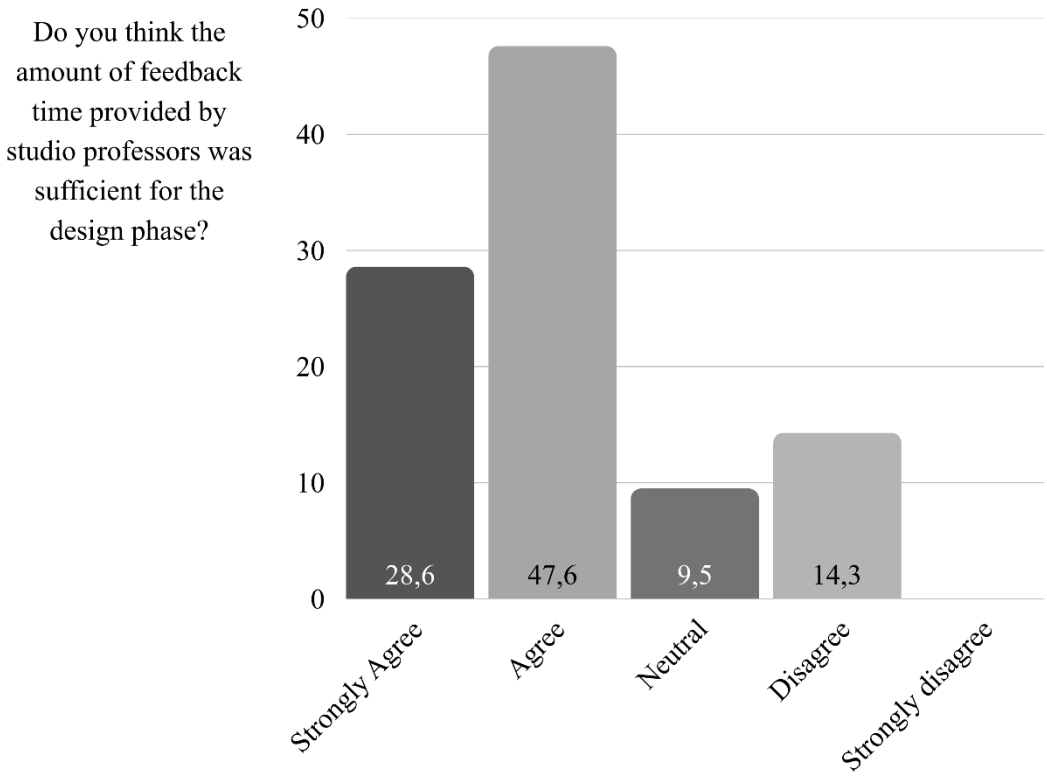


Figure 31.

Answers to the question: Do you think the amount of feedback provided by studio professors was sufficient for the design phase? Table drawn by the author.

There were no 'strongly disagree' answers; however, a small percentage (14.3%) disagreed with the statement. This outcome highlights the importance of organizing the online studio hour and its positive impact on students. Synchronous online studio hours were deemed sufficient for students to develop their projects. The minority might indicate that the varied students' needs and project complexity require different amounts of critique time. Therefore, the studio critiques were preserved on online platforms.

Online education offers benefits, such as the ability to invite professionals to deliver detailed lectures on their respective topics. During the online studio hours, many professionals worldwide delivered lectures to enable students to benefit from their expertise and learn international practices. The sixth question directly addressed the impact of these lectures on the students. The question was: "Were you satisfied with the online additional lectures given by global professionals in the studio?" 23.8% students strongly agreed with the statement, and 38.1% students agreed (Figure 32)

Therefore, 61.9% of students reported that the additional lectures were beneficial. 23.8% of students disagreed with the statement, while 14.3% kept neutral on the statement.

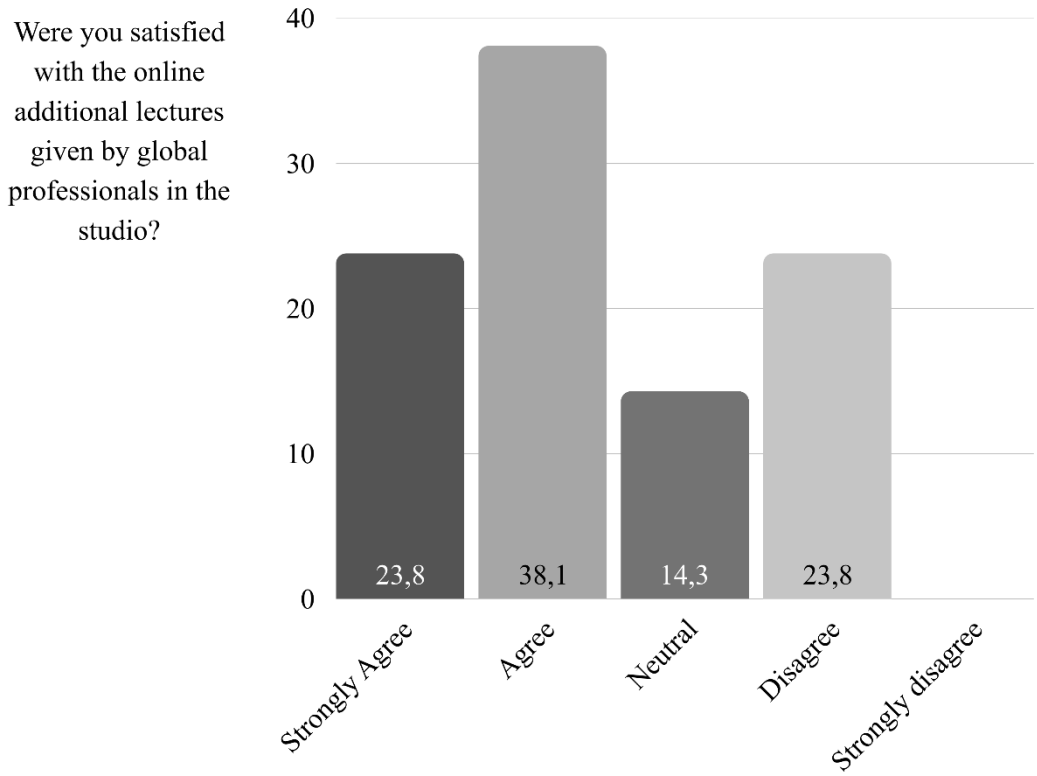


Figure 32.

Answers to the question: Were you satisfied with the online additional lectures given by global professionals in the studio? Table drawn by the author.

The varied responses suggest that while some students found the lectures relevant and integrated into their designs and projects, others found them detached from their own work and unable to apply what they had learnt from the professionals. While students learnt about global perspectives and expanded their international perspective on the topic, some did not benefit from these.

Traditional studios are open areas where students can work, with most technical resources provided. They allow students to interact, do experimental work, construct physical models, and receive immediate feedback, especially from their peers. However, because distance education was new to all students and required different technical skills, some students faced challenges during the COVID-19 pandemic. The

next question was directly related to these challenges. The question was: “During distance education, did you face any challenges while working on your designs?” This was a yes-or-no question, followed by an open-ended question to elicit the underlying reasons for these technical difficulties. Half of the students (57.1%) reported technical challenges and answered "yes" to the question (Figure 33). Students who answered 'yes' to the question were asked to respond to the next question, which required them to explain the difficulties in detail.

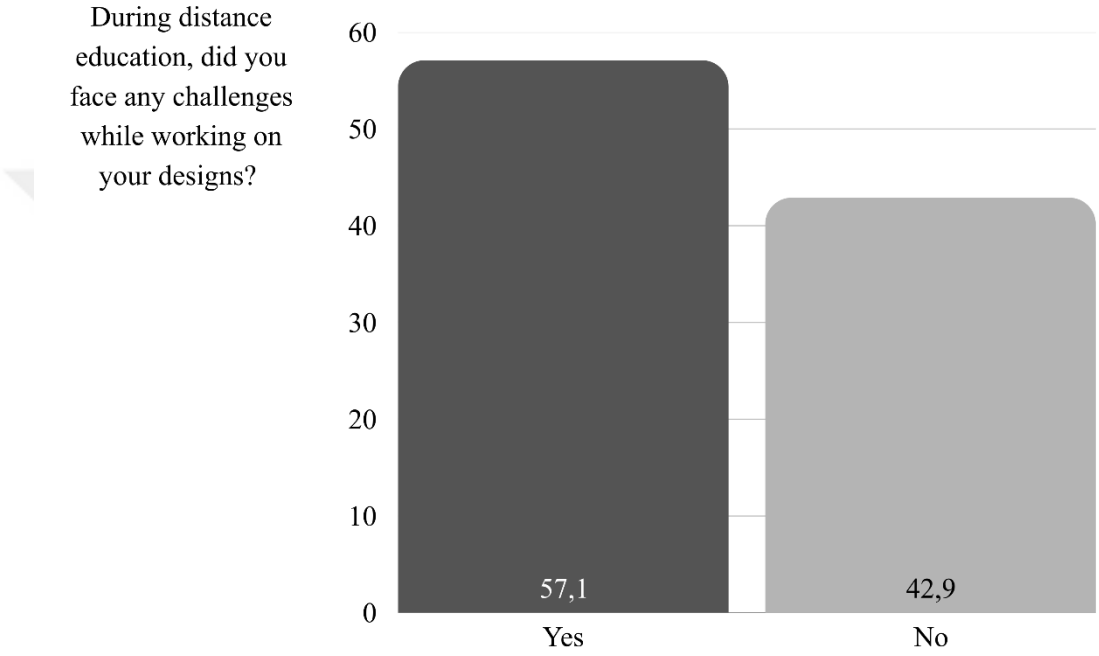


Figure 33.

Answers to the question: During distance education, did you face any challenges while working on your designs? Table drawn by the author.

Most students who answered “yes” indicated that the difficulties they faced could be attributed to the topics “Lack of studio environment” and “Lack of peer interaction”. The lack of a studio environment was evident in both the physical and mental aspects. The answers given are mostly on these two main aspects of the studio environment:

> Answer 1: The studio environment is sufficient while sharing the studio environment. In addition to that, communication and collaboration among fellows during studio sessions and after class studies are extremely important for the process of architecture students. According to these beliefs of mine, online studio lectures are insufficient in terms of architectural education. Communication and sharing ideas with overall classmates are limited to small close friendship groups.

Answer 2: Hard to draw sketches and try to explain the idea

Answer 3: Because I was home, my routine was different from what it was when I was going to school. With people coming in and out of rooms, either with the cleaning sound coming from next door, or the Wi-Fi not working as well, or the lightning not being as good as the studio or not having the space for all my architectural projects, it was harder working from home. That's why I think the studio lecture hours should have been more flexible, and the camera always being open was sometimes really hard. Also, in architecture I think people should be around while you work for you to help each other and develop together. Also I think the teaching assistants and instructors should be more involved with not only the students' work but also their lives and connect with the students not only on a professional level but learn their lives and know each person their weaknesses and their strengths and help them find their style and path in life because a studio space should be more of a masters and apprentices relationship with each other and care for each other. Because it's a small school, it should be easier to do this, but there are too many students in one studio.

Answer 4: Hard to focus, being far away from the physical studio place, and had to work on the computer.

Answer 5: My computer couldn't handle online meetings and design software at the same time. It crashed down, had to get a new one.

Answer 6: Lack of physicality and not having the studio environment experience.

As shown by the responses, most students who reported difficulties cited a lack of a studio environment. While some of them had technical difficulties (answers 2, 3, 4, and 5), others, such as answers 1 and 6, experienced mental strain due to the lack of a studio environment.

The second most common responses to the difficulties concerned peer interaction. The studio is an environment where students can critique one another's work, collaborate on projects, or learn from peers. With the transition to the online studio, students had to work independently throughout their design process. They have explained these difficulties as:

Answer 7: Lack of motivation and design ideas sharing, and learning from peers.

Answer 8: It is hard to know how to work on the project. Because studio is a place that we all work and also learn from our friends projects.

Answer 9: Not being able to design while socializing in the studio was quite challenging in terms of motivation throughout the period.

The outcomes of this section of the survey highlight how students' perceptions of the studio and design process changed during the transition to distance education. While the studio was a collaborative space where students received ongoing critiques, collaboration, and feedback, the shift to distance education altered how it operated. The answers reveal that the students felt the lack of a studio both technically and mentally. While the content, feedback time, and studio hours were sufficient for most students, half struggled with technical difficulties inherent to the distance education system. Some students stated that the lack of peer interaction, studio environment, and studio culture did not replace the traditional studio. From the answers, it can be concluded that while online studios enabled a new form of education and introduced new technical capabilities and methods, they did not fully realize the potential of a traditional face-to-face studio from the students' perspective.

4.2. Online Group Work

The radical change in the studio environment significantly affected how the design process operates for students. In architectural design, group work is fundamental to many aspects of the discipline because it fosters peer feedback, teamwork, and knowledge sharing. Therefore, at TED University, every semester includes small- or large-group work to improve design and processes. When the traditional studio transitioned to an online format during the COVID-19 pandemic, group work also needed to be adapted to the new educational system. There are 5 questions in this section, one of which is open-ended. The questions concern both the process and the outcome of the group work, thereby highlighting the students' underlying challenges and preferences. This section of the survey examines how students perceived and experienced group work in an online environment, focusing on the design process and satisfaction with the outcome.

The first question asked was, “Were you satisfied with the progress of group work in the online studio environment?” While 40% of the students agreed with the statement, only 5% strongly agreed. In total, 45% of the students found the progress was efficient. However, 40% of students preferred a neutral response, and 10% disagreed with the statement. (Figure 34) It can be stated that students faced both challenges and benefits simultaneously, creating an uneven experience that led them to choose the neutral option.

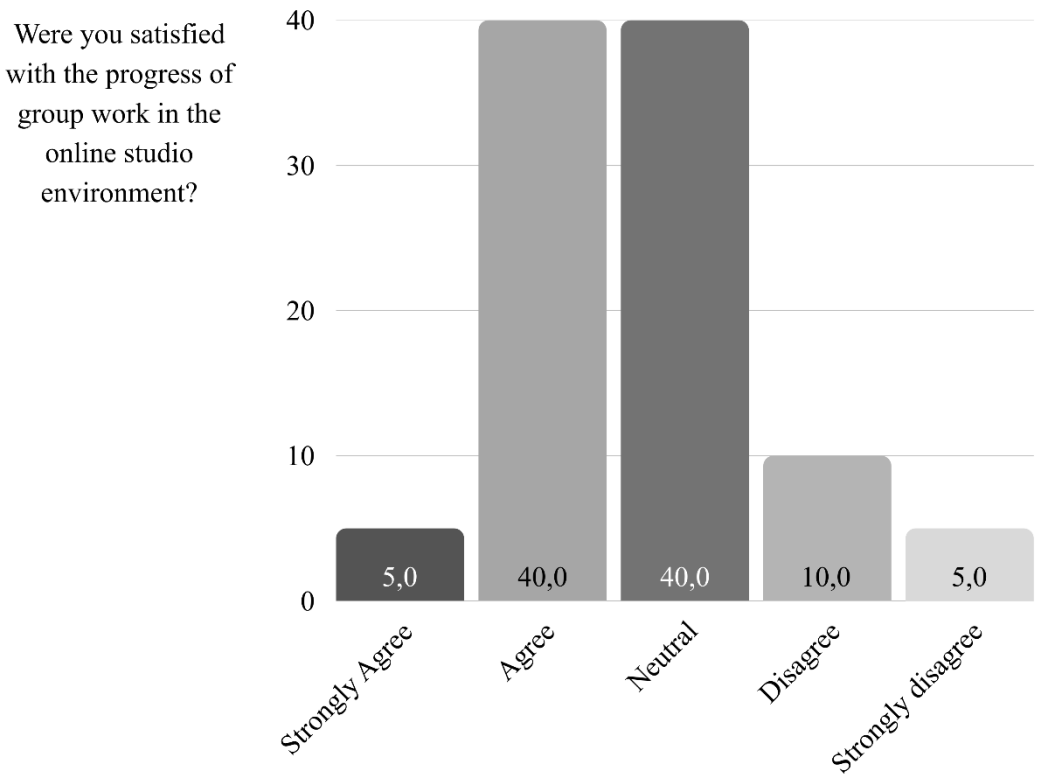


Figure 34.

Answers to the question: Were you satisfied with the progress of group work in the online studio environment? Table drawn by the author.

The second question concerned the outcome of the group work. “Were you satisfied with the outcome of the group work during the online studio environment?” Satisfaction with the outcome increased more than satisfaction with the progress. 40% of students agreed, and 15% strongly agreed with the statement. The neutral choices dropped down to 20%, and the percentage of disagreement increased to 15% (Figure 35).

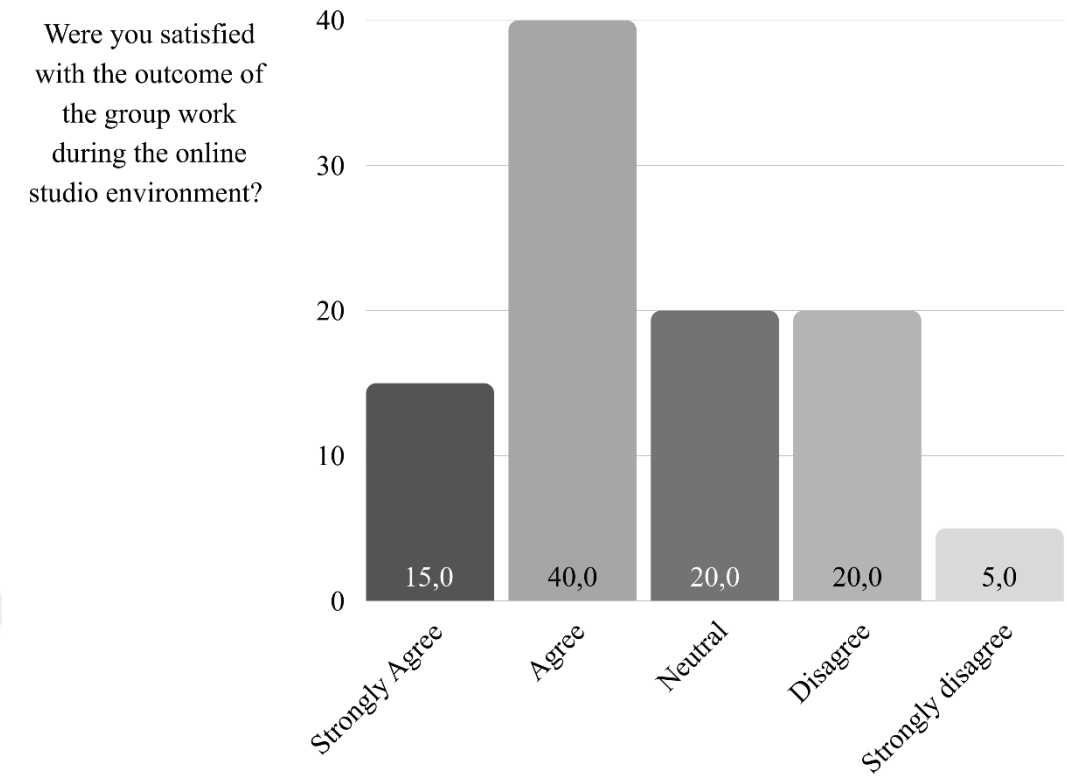


Figure 35.

Answers to the question: Were you satisfied with the outcome of the group work during the online studio environment? Table drawn by the author.

This indicates that students have clearer ideas about outcomes than about progress. Since the outcome is a debatable end product of the group work, it was easier for students to provide stronger answers. The answers indicate that dissatisfaction with the group work process also affected the outcome, thereby increasing disagreements on this question.

The next question in this section was a yes-or-no question: “During distance education, did you face any challenges while working on your group project?” Group projects include coordination, idea exchange, shared material work, shared knowledge, and continuous feedback. Since distance education was a new platform for the students and many had technical inabilities during the distance education, challenges specific to group work were asked. Most students (60%) reported encountering challenges. (Figure 36)

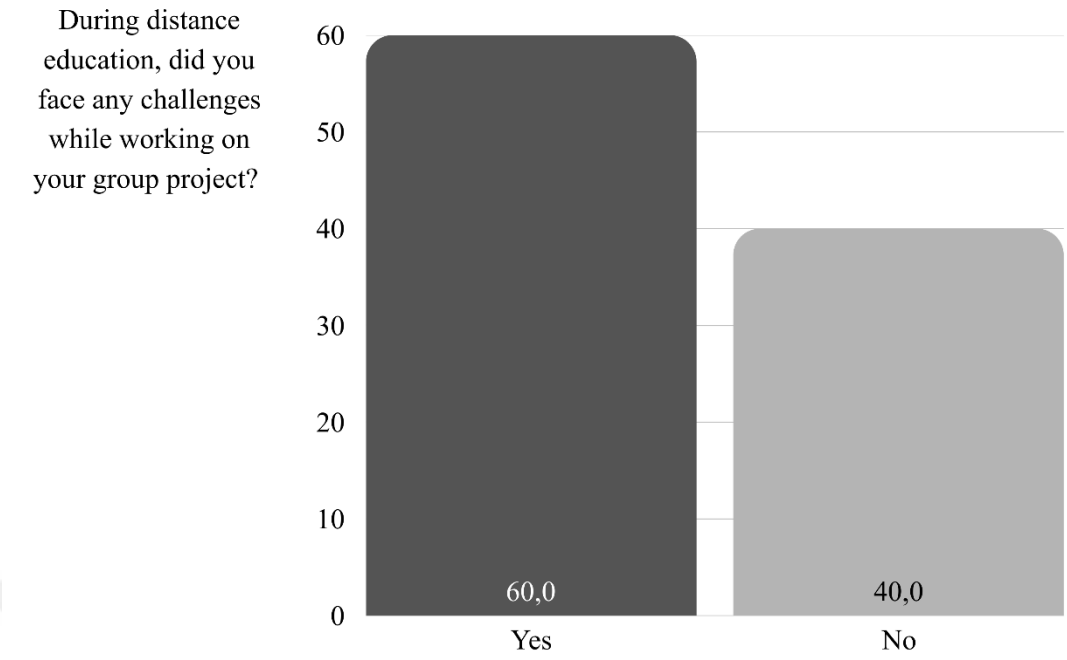


Figure 36.

Answers to the question: During distance education, did you face any challenges while working on your group project? Table drawn by the author.

The students who answered yes were asked to specify the particular challenge they encountered during distance education. Among the answers, the most common difficulty for the students was communication problems, followed by technical inabilities. Communication is one of the most crucial parts of group work. As the design process progresses, several critiques were conducted, and based on these critiques and idea exchanges, groups design for each studio day. Communication problems written by the students:

> Answer 1: Being away from the physical studio area and having to meet online also. It affected communication.
>
> Answer 2: It was really hard to conduct a group work in distance. The distance was blocking communication and arranging a working time. This caused members of groups to not do their duties. That is why all the responsibility is conveyed to the ones who care about the issue. Additionally, in online courses presenting the group work was also difficult. The ones who do not want, were leaving the zoom room during the presentations.
>
> Answer 3: It was harder to present our project online because of lack of communication.

Some answers included technical inabilities and how those inabilities created the communication problems that the students faced.

> Answer 4: Yes, since we didn't have a Zoom membership, we constantly had to send new links when giving our critiques to our friends. This disrupted the flow of communication and slowed down the progress of the group assignment.
>
> Answer 5: Sometimes reaching out to other group members was hard due to internet connection problems. And also group members would ghost other members in order to skip work.

Some answers were directly about technical inabilities. Such as:

> Answer 6: Connection problems
>
> Answer 7: Sometimes reaching out to other group members was hard due to internet connection problems. And also group members would ghost other members in order to skip work.

When discussing group work, peer interaction and communication are inevitable topics. As can be seen from the responses, technical difficulties affected communication between peers, resulting in dissatisfaction with distance education, particularly regarding progress and, ultimately, outcomes.

The last question about group work was “Would you prefer working in a group in online studio environment or face-to-face studio environment?” The majority of students (80%) chose the traditional face-to-face studio environment for group work (Figure 37).

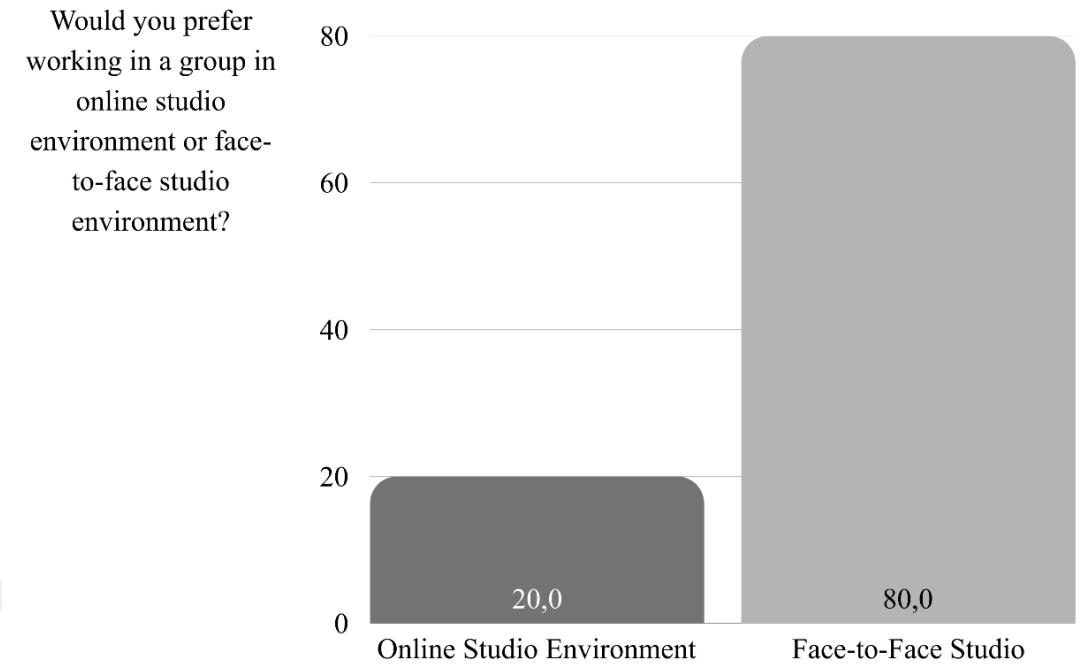


Figure 37.

Answers to the question: Would you prefer working in a group in an online studio environment or a face-to-face studio environment? Table drawn by the author.

Although synchronous education is delivered through a collaborative design process, students prefer traditional face-to-face design studios. While dissatisfaction rates are approximately 40%, preference for a physical studio is strong, indicating that some students who were satisfied with both the process and the outcome still choose a traditional studio over an online studio during distance education. This preference can be interpreted as reflecting communication problems, technical difficulties, the need for immediate feedback, and a shared physical experience, as students also noted when discussing their challenges. It can be stated that not only those who were dissatisfied experienced these challenges, but most students also felt their absence.

The studio was the space where group work could be conducted efficiently. It was a collective space, where students could meet, share knowledge and ideas, design together, and give continuous feedback to each other. The studio space shapes students' interactions, creating common ground among them. Therefore, the studio was a crucial part of the group work. The transition from physical to online studio also changed communication among peers, collaborative design, and meeting practices.

The outcomes of this section of the survey indicate that online group work in distance education posed several challenges for students, particularly related to technical difficulties and peer communication. Students struggled to work in groups, and their overall satisfaction decreased relative to working individually. It can be stated that the absence of a physical studio reduced peer communication, resulting in dissatisfaction with both the process and the outcome of the group work. In addition to dissatisfaction, many students preferred working in a traditional face-to-face studio to an online studio, even when it was synchronous.

4.3. Peers

One of the crucial components of architectural education is peer interaction among students. This is also one of the areas in which architectural education differs from other fields. Peer interaction shapes both the outcome and the design process, even when working on an individual project. Observing peers' work, exchanging ideas, and receiving constant feedback expands students' perspectives, thereby increasing their creativity. However, since the studio's physical space was lost through online education, this interaction was also damaged. This section of the survey comprises 5 questions about peers to examine how students at TED University perceived the changes in peer interaction during the transition to online education.

The first question asked in this section was "Do you think peer feedback affects the final product in architecture?" A large number of students (90.5%) reported that it affects it. More than half of respondents (52.4%) strongly agreed with the statement. Only a small percentage (4.8%) disagreed with the statement, and there were no strongly disagreeing choices on the answers. (Figure 38)

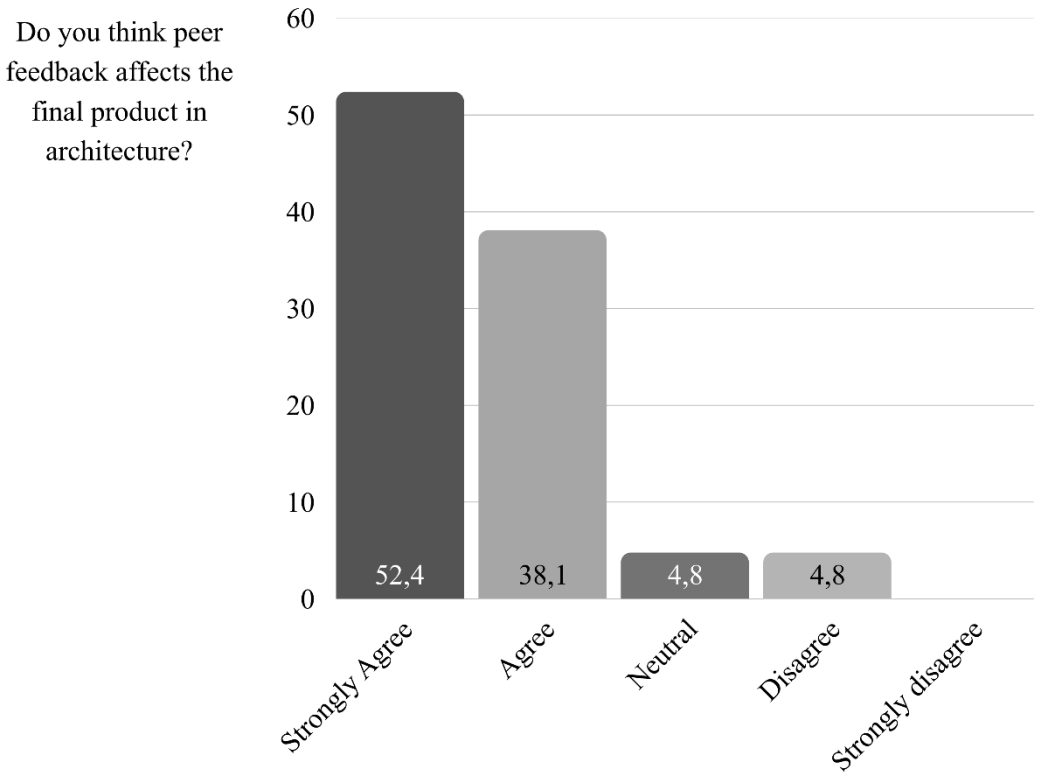


Figure 38.

Answers to the question: Do you think peer feedback affects the final product in architecture? Table drawn by the author.

The answers reveal that peer evaluation and feedback are crucial in the design process. Students perceive that exchanging ideas with peers enhances their work, thereby affecting the end result. The results highlight that peer critique is not merely a supportive element in the design process but a fundamental component of the design studio.

The second question focused on distance education: “Were you satisfied with the interaction with your peers' works during the online studio environment?” 42.9% of participants agreed that they were satisfied with their interaction with peers’ work. 33.3% chose to stay neutral, while 14.3% strongly disagreed with the statement. (Figure 39). The answers show that nearly half of the students were satisfied with the process, while some were dissatisfied. The neutrality might suggest inconsistent interaction with peers, perhaps due to technical limitations in online education. The data indicate that the online education environment lacked sustained peer interaction and resulted in limited opportunities for feedback.

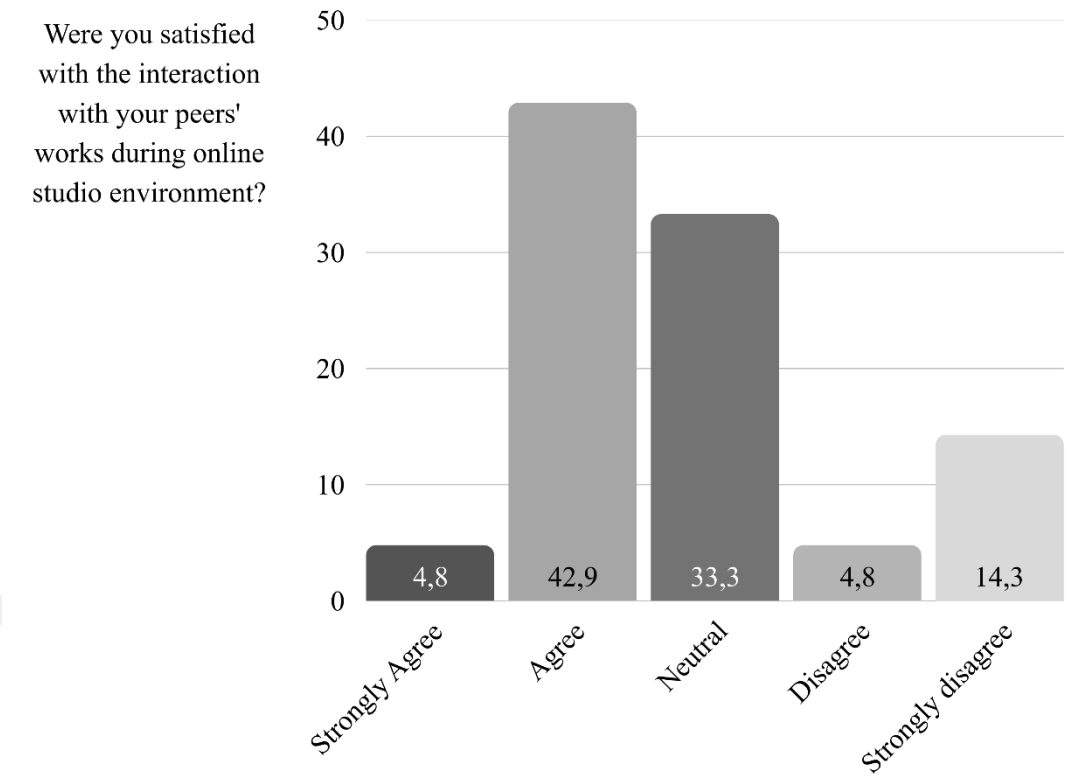


Figure 39.

Answers to the question: Were you satisfied with the interaction with your peers' works during the online studio environment? Table drawn by the author.

The third question was “Did you have sufficient opportunities for collaborating with peers during distance education?” Half of the students (52.4%) agreed with the statement, while only 9.5% strongly agreed. Although half of the students agreed, a considerable number of students (28.6%) disagreed (Figure 40).

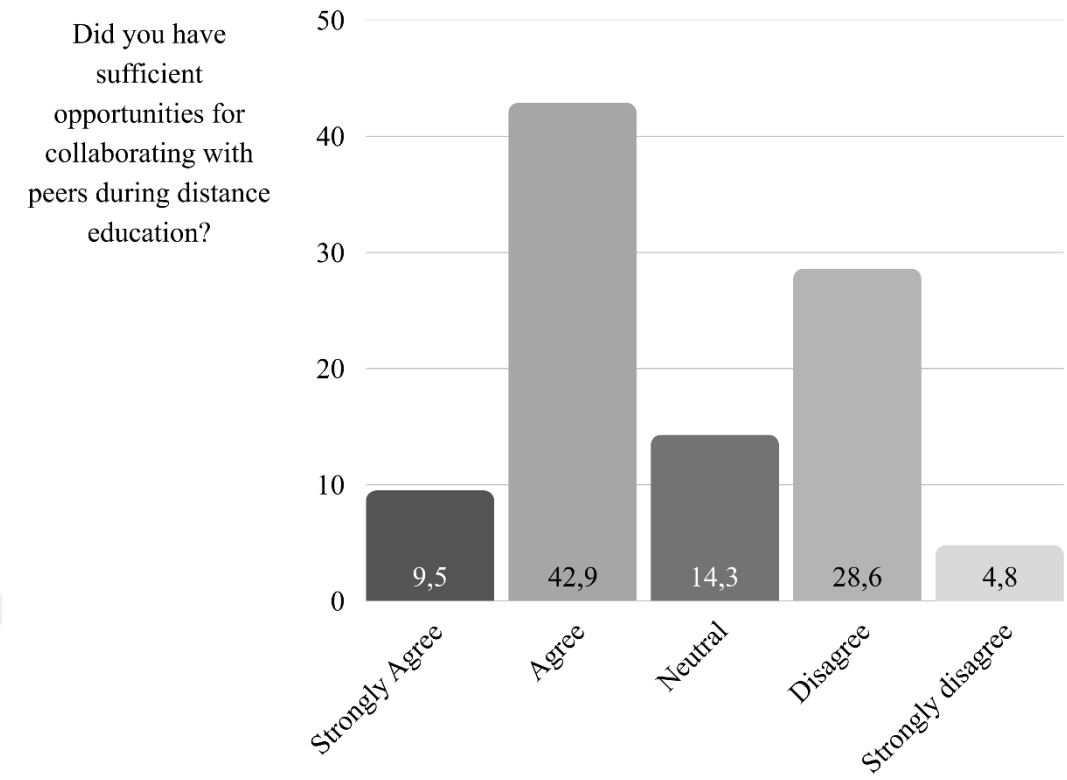


Figure 40.

Answers to the question: Did you have sufficient opportunities for collaborating with peers during distance education? Table drawn by the author.

A nearly identical distribution of choices might indicate that, although the opportunities for collaboration were valid, they were neither effective nor accessible for some students. Platforms primarily used by the TED University Department of Architecture included Zoom, Google Drive, and Microsoft Teams. Compared with a traditional studio environment, online studio education on these platforms has limitations in visual sharing, draft sketching, and communication. This might be another reason behind the equally distributed answers. It can be said that while online platforms allowed students to collaborate effectively, they could not reach the level of sufficiency of a traditional studio.

The next question examined how the process of conveying the advice affected students' satisfaction with it. The question was “Were you satisfied with advice and help from your peers in the design studio during online studio learning?” The answers were nearly identical in distribution, but they were closer to the positive side. 33.3%

of students agreed, 19% strongly agreed, and 28.6% were neutral regarding the statement (Figure 41).

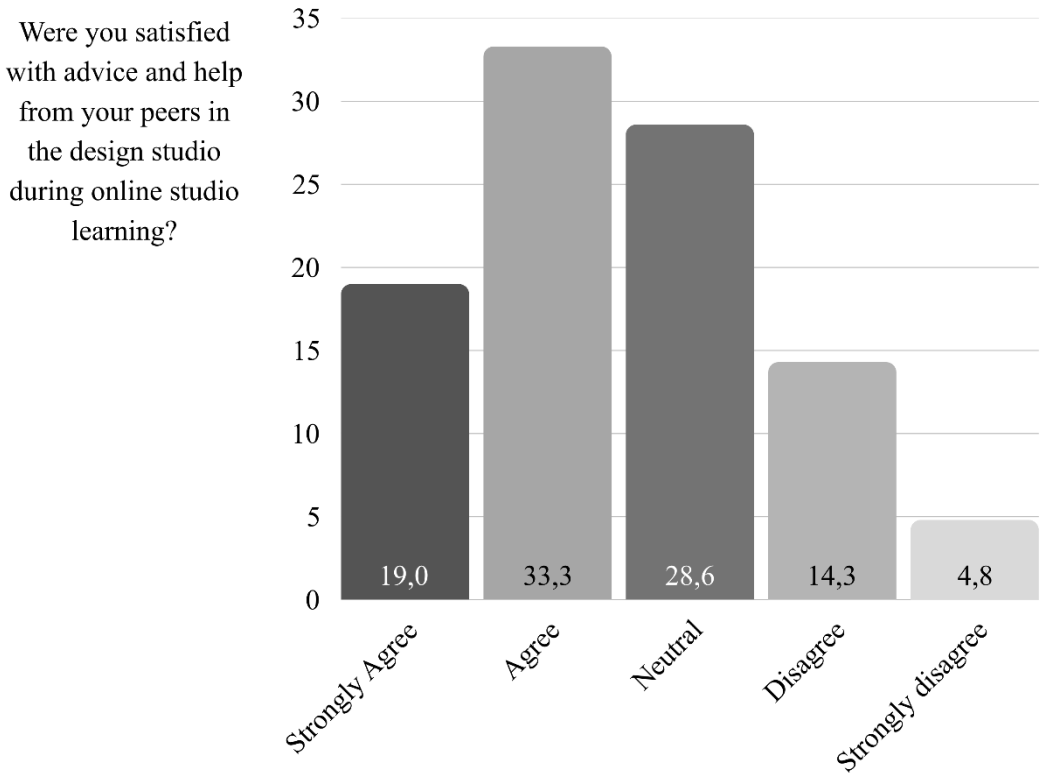


Figure 41.

Answers to the question: Were you satisfied with the advice and help from your peers in the design studio during online studio learning? Table drawn by the author.

This shows that, without face-to-face contact, the online communication method affected students' satisfaction with peers' advice. The limited range of disagreement options suggests that, during the design process, some students may not have benefited from the peer and collaborative atmosphere of the traditional studio. It can be stated that, although peer communication and help were valid, the effectiveness of peer advice and help decreased relative to the traditional studio environment.

Due to the technical limitations of the online studio, students had limited resources and few ways to convey them to peers. The next question was “Were you able to share resources with your peers during the design phase in the online studio environment?” With 61.9% selecting "agree" and 19% selecting "strongly agree," students found it easy to share resources during the online studio (Figure 42).

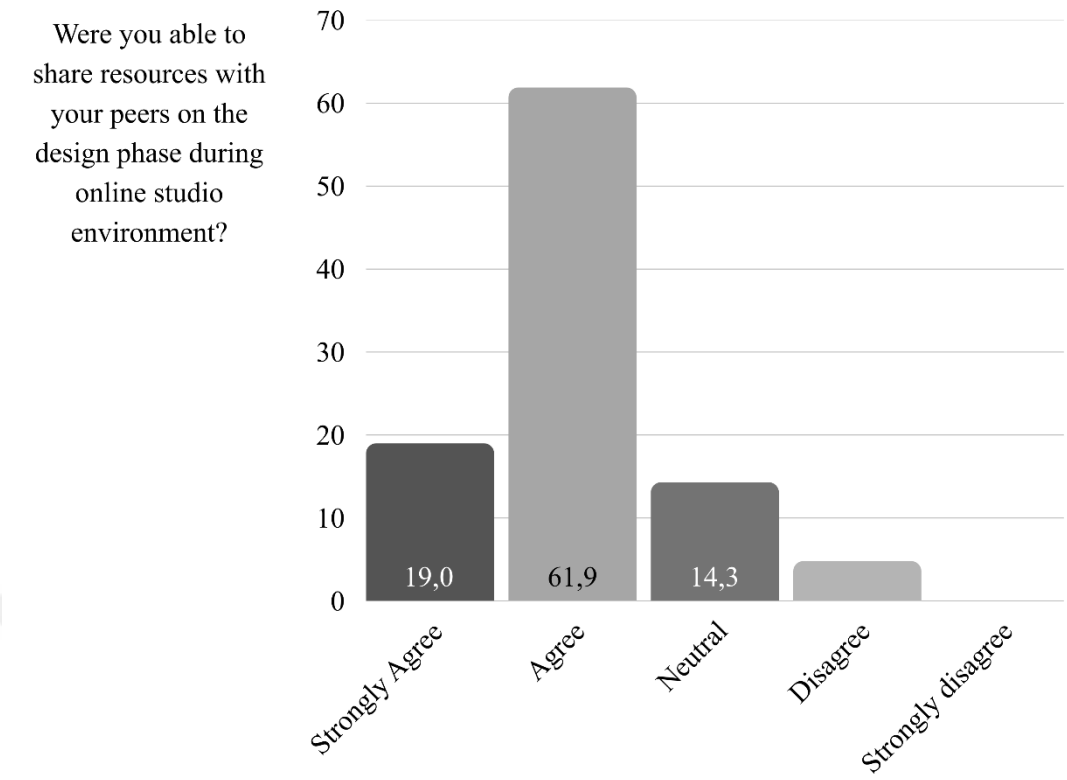


Figure 42.

Answers to the question: Were you able to share resources with your peers during the design phase in the online studio environment? Table drawn by the author.

As materials, resources, and technical tools became digital, students found it easier to share them. The high rate of agreement states that, unlike face-to-face communication, students found efficient ways to exchange materials and resources. The small number of students who disagreed with the statement might underline individual preferences for communication.

Peer interaction is a central component of traditional architecture studios. Students gain knowledge not only from instructors' critiques but also from discussions with peers, observing peers' work, sharing resources, and collectively developing ideas. The studio culture, shaped by peer interaction, influenced both the design process and students' personal knowledge. The results of this section of the survey indicated that peer interaction was effective through the online design studio across various formats. While satisfaction with peer interaction and collaborative work decreased in the limited online studio environment, students found new ways to convey ideas and exchange materials. The effects of face-to-face communication and direct contact

could not be replicated on online platforms, but students found new communication formats. Overall, peer interaction changed during the transition to online studios, but the need for it remained valid for students throughout the design process.

4.4. Products of Distance Education

The shift from a traditional architectural studio to an online studio not only changed collaboration, communication, and the way of working, but also the products students have designed. Hands-on modelling has been replaced by 3D digital modelling. Spatial experiments were cut, and peer interaction changed its format. Therefore, every concept was redefined in the format of online education. This radical change in the design process ultimately affected its outcomes. This section of the survey examines how students evaluate the products of the online design process, how the work environment affects outcomes, and the level of creativity among design students. The section offers an insight into the transition to an online design studio, which reshaped the design outputs of architectural education.

The first question of this section was “Do you think the working environment affects your learning process in architecture?” More than half of the students (57.1%) strongly agreed, and 38.1% agreed with the question; none disagreed or strongly disagreed. This indicates that a clear majority believes that the working environment affects the learning process in architecture. (Figure 43)

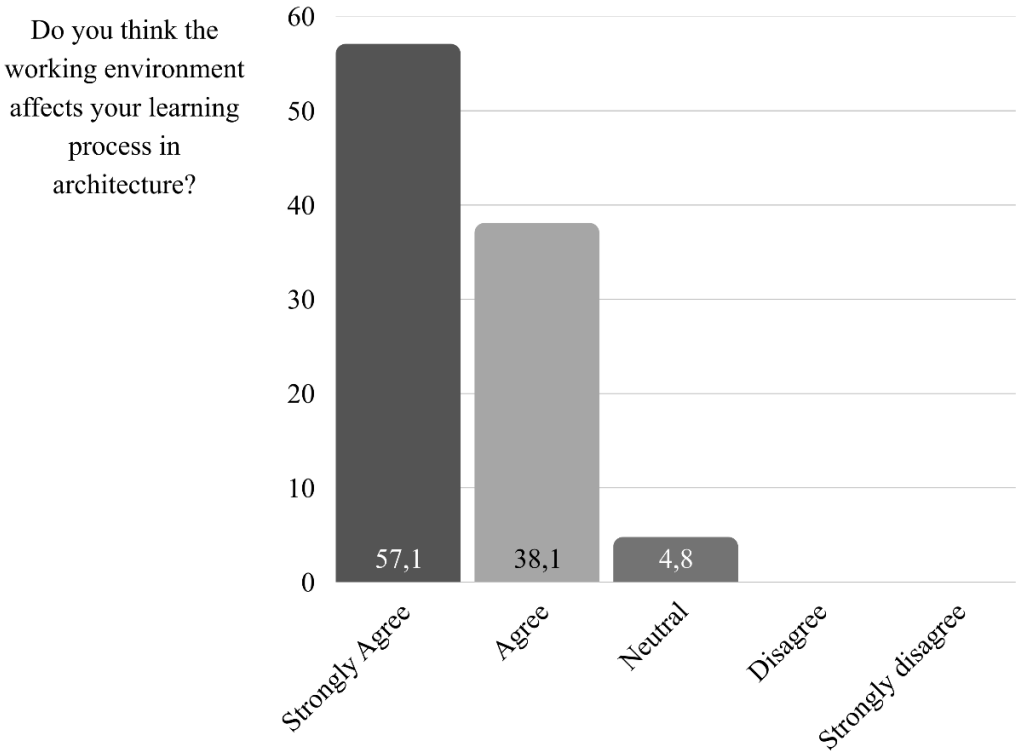


Figure 43.

Answers to the question: Do you think the working environment affects your learning process in architecture? Table drawn by the author.

Architectural learning is closely tied to the spatial and social conditions around the students. Therefore, the architectural studio relies on shared peer critique, continuous exposure to peers' work, and spatial experimentation. The absence of disagreements suggests that students view the work environment as an essential component of the design and learning processes in architecture.

The second question narrowed the first question's answers and examined how design outputs were related to the working environment. The question asked was “Do you think the working environment affects the quality of the final product in architecture?” Similar to the first question, nearly all students (95.3%) strongly agreed or agreed with the statement, with no strongly disagree or disagree responses. (Figure 44)

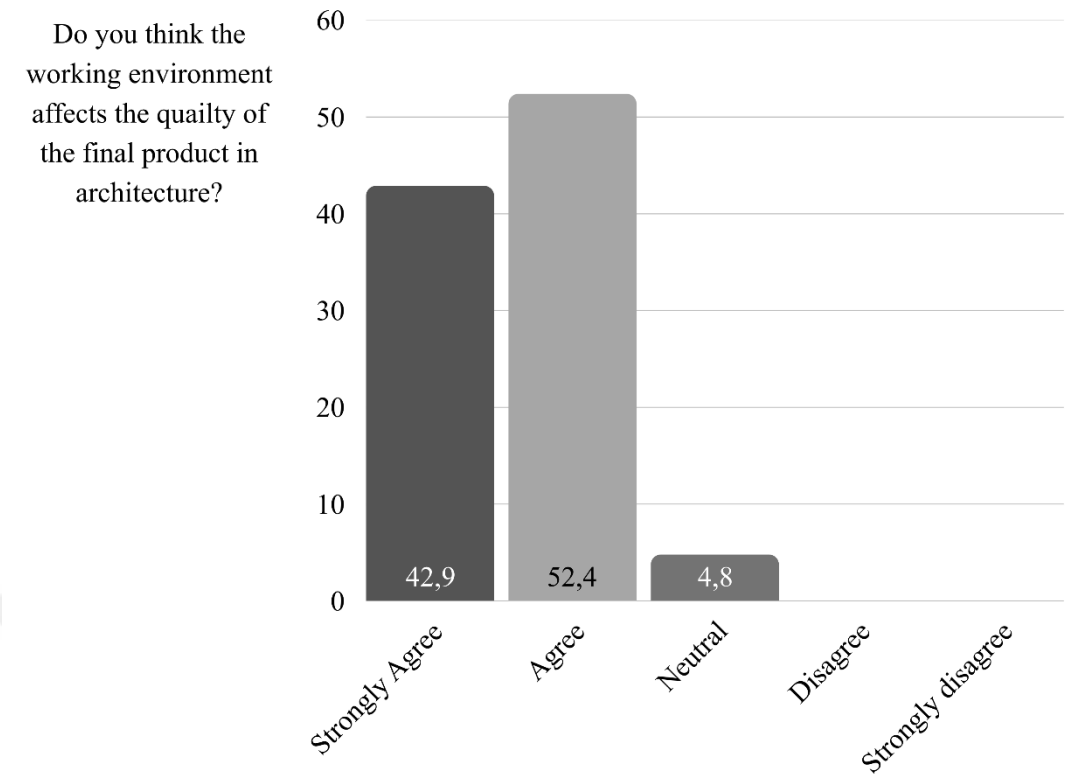


Figure 44.

Answers to the question: Do you think the working environment affects the quality of the final product in architecture? Table drawn by the author.

The agreement's dominance indicates that students directly associate the quality of design outputs with the working environment. Architectural production, which includes physical modelling, peer feedback, and shared knowledge redefined throughout the online design process, eventually affected the design outputs. No disagreements were raised that the students were aware of the relationship between the design output and the architectural studio, which is the students' working environment.

The third question focused on distance education: “Did the tools or resources available during distance education influence your final product?” More than half of the students (57.1%) agreed, and 28.6% strongly agreed; 14.3% were neutral, with no disagreements or strongly disagreements (Figure 45). These data show that most students believed that resources and technical tools played a fundamental role in their design output.

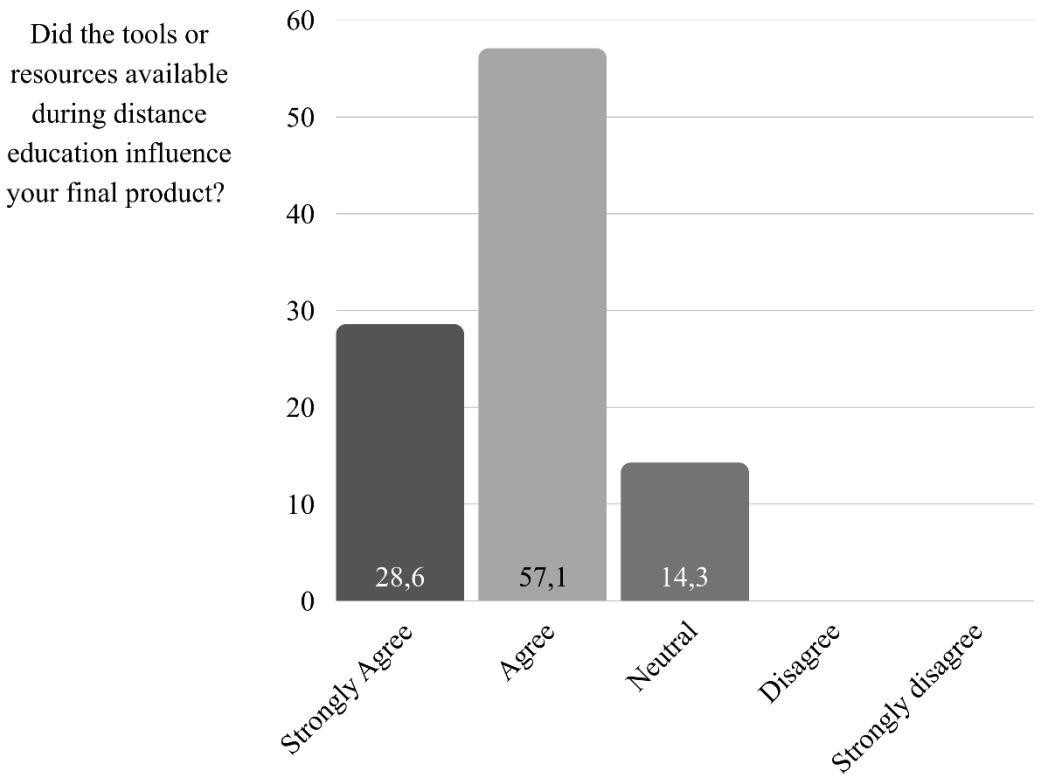


Figure 45.

Answers to the question: Did the tools or resources available during distance education influence your final product? Table drawn by the author.

Students' answers indicate that the transition to 3D modelling software and tools, the lack of physical modelling, and their technical abilities in online formats played significant roles in both the research and design phases of their design process.

The last question of this section was “Do you think that your creativity was enhanced during distance education compared to a face-to-face studio working environment?” Unlike this section’s other questions, the answers to this comparison question are dispersed. 9.5% strongly agreed, 28.6% agreed, 28.6% neutral, 14.3% disagreed, and 19.0% strongly disagreed with the question. (Figure 46). The dispersed answers may indicate that students' perceptions of creativity differ.

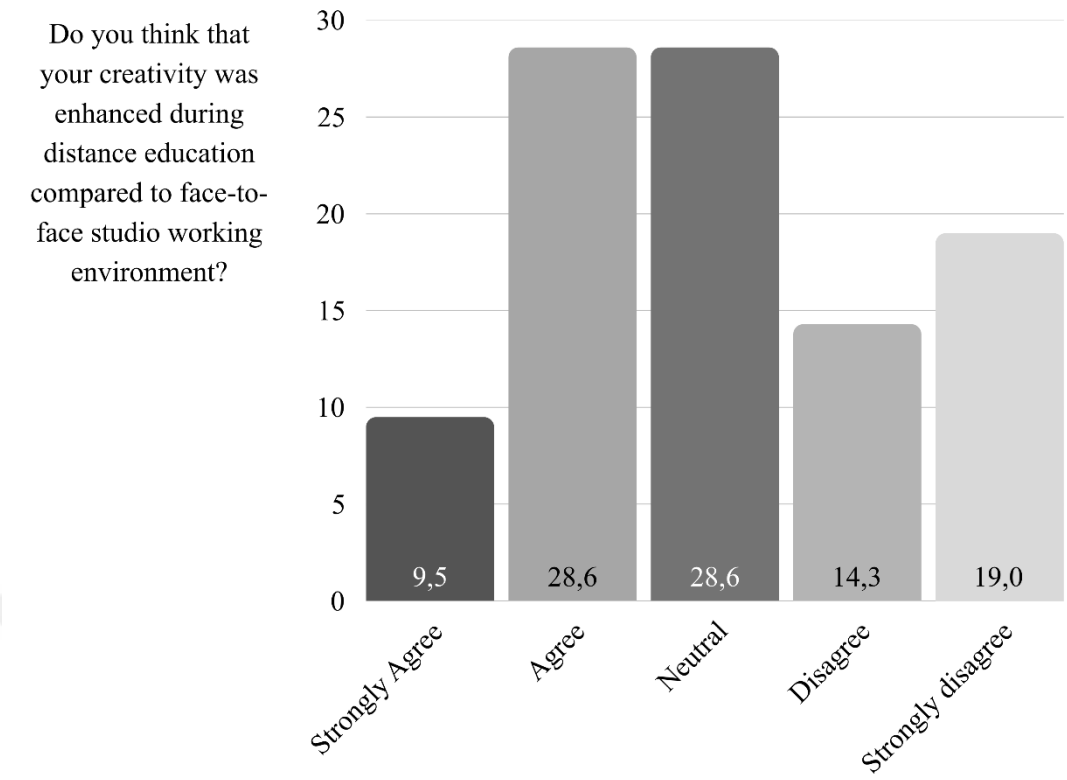


Figure 46.

Answers to the question: Do you think that your creativity was enhanced during distance education compared to a face-to-face studio working environment? Table drawn by the author.

While some students' creativity was directly linked to the environment, other students' creativity might be related to research, spatial experiments, or physical modelling. Therefore, while some students found that their creativity was enhanced, some might feel the lack of it. It can be said that creativity has social and environmental inputs that were changed by the online studio environment.

The outcomes of this section of the survey demonstrate how students perceive the design process and the quality of the output with respect to the working environment, which is the architectural studio. Nearly all students agreed that the work environment affects creativity and, ultimately, the final products they design. The strong ideas of the students highlight that the spatial conditions, social interactions, and shared knowledge support the design process. performances. In addition to spatiality and sociality, technical tools and resources significantly affect students' performance. The transition to the online education system also altered the tools and materials students

used, thereby affecting the design process and the output. While the students agreed on the effect of the work environment on design outcomes, they did not fully agree on the concept of creativity, which may indicate that creativity is a personal construct. Overall, this section examined students' perceptions of products designed in an online architectural studio and how these perceptions were affected by the new conditions of the online environment.

4.5. Overall Evaluation

The final section of the survey examined students' overall perceptions of the distance studio and the traditional face-to-face studio. While the previous sections analyzed the fundamental parts of studio culture, such as peer interaction, working environment, feedback, and group work in detail, the concluding section included questions focused on students' previous experiences of the online studio and their preferences for the future. The answers provide a holistic perspective on the online studio within the framework of architectural pedagogy.

The first question was "Would you prefer to study in a distance education online studio environment or a face-to-face studio environment?" A clear majority of students (76.2%) chose a face-to-face studio environment over an online studio environment (23.8%) (Figure 47).

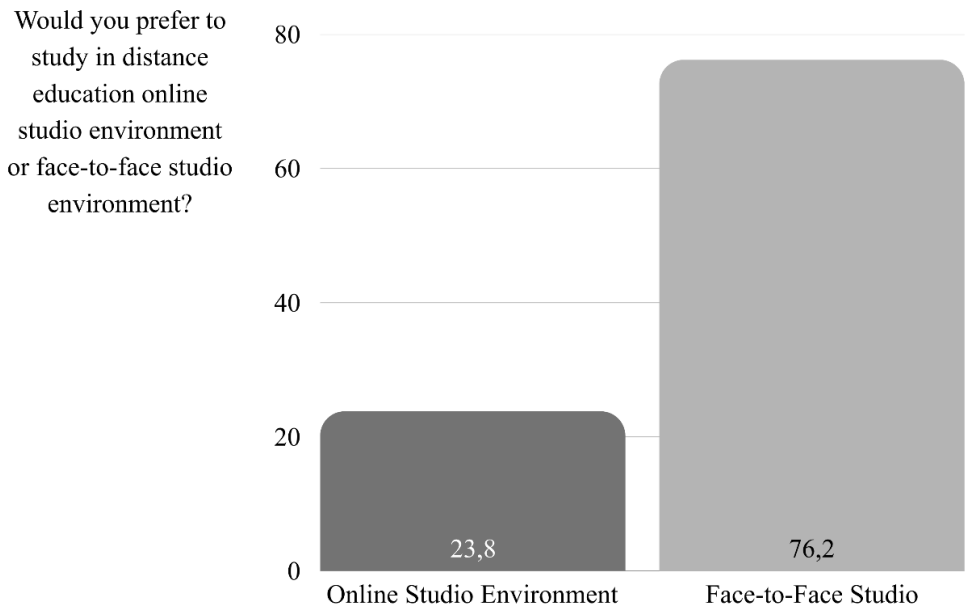


Figure 47.

Answers to the question: Would you prefer to study in a distance education online studio environment or a face-to-face studio environment? Table drawn by the author.

The students' preferences align with earlier findings in the sections above, in which students highlighted the challenges of peer interaction, the lack of a studio environment, and technical limitations resulting from the shift to online education. The small number of students may be due to those who found that creativity increased during online education and benefited from this change. Overall, the data indicates that face-to-face studios remain the preferred mode of instruction for students during architectural education.

The last question of the survey was “Would you recommend distance education - online studio environment for future architecture students?” More than half of the students (61.9%) disagreed or strongly disagreed with the recommendation of online studio education. Only 28.6% of students agreed to recommend it, and there were no strongly agree options. (Figure 48).

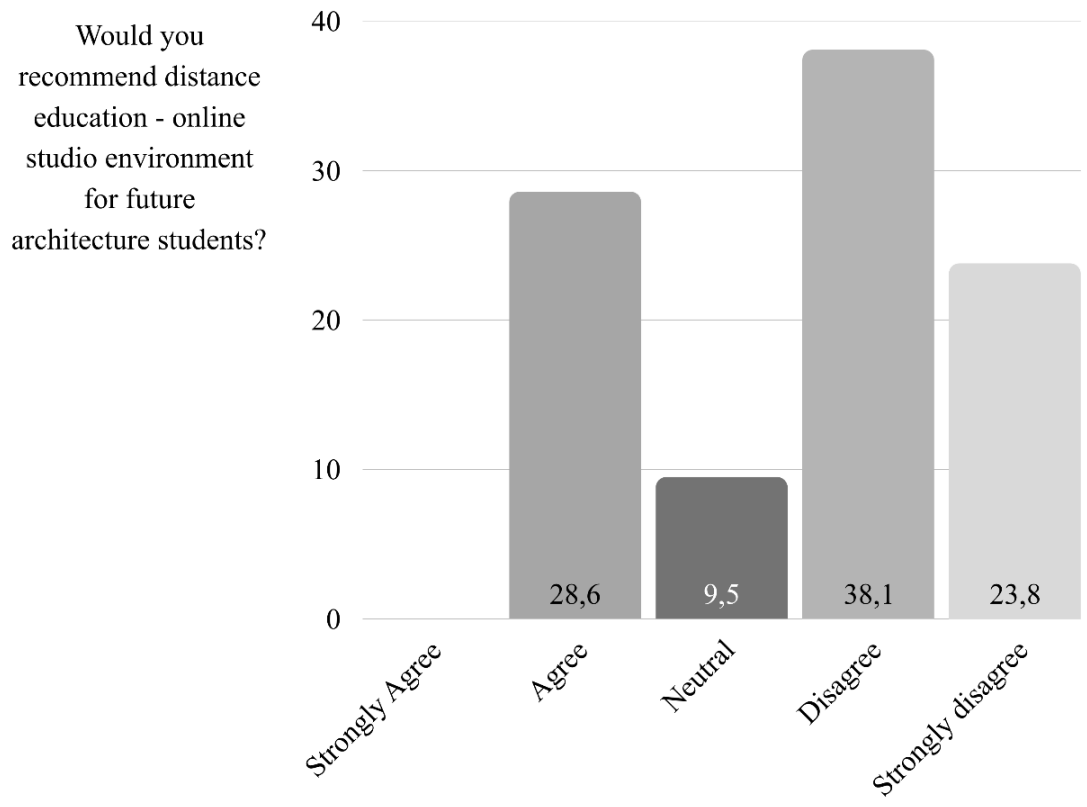


Figure 48.

Answers to the question: Would you recommend distance education - online studio environment for future architecture students? Table drawn by the author.

Answers indicate that, despite adapting to online education, students faced challenges and found it neither effective nor desirable. The large number of disagreement options indicates that students' ideas align with the outcomes from the previous sections.

The outcomes of a survey conducted at TED University among students who had an online architectural studio during the COVID-19 pandemic provide insight into students' perceptions of the sudden transition from the traditional studio to the online studio. According to the students' responses across all sections, while they were able to continue their architectural education online, online studio education could not replace the social, spatial, and pedagogical qualities of the traditional architectural studio. There were five sections in total to reach a comprehensive understanding of the outcomes of online studio education. The outcomes of the studio process section revealed that the students adapted to the online studio in terms of studio hours, feedback time, and communication methods. However, the absence of a physical studio environment still affected their peer interaction and the quality of feedback. Students saw the studio as a dynamic environment, and the studio culture; therefore, static online studio education did not fully support design development. The second section of the survey focused on group work on the online education system. Architectural education has always included collaborative tasks, and the transition to online education has also changed the style of group work. Students reported that, while working in groups, technical and communication difficulties affected both the process and the outcomes. Spontaneous interaction, continuous feedback, and shared knowledge were lacking in online studio education. Therefore, in group work, students strongly prefer a traditional face-to-face studio environment in which all these were provided. The third section explored the peers. Peer feedback, peer critique, observing others' work, and shared knowledge are key aspects of the traditional architectural studio. These aspects enhance creativity and the design process. While students could share resources online, their overall experience of peer interaction in the online studio was limited by technical constraints and the absence of a physical studio environment. The products of distance education were another section that was asked in detail to students. Students highlighted that the working environment affected both the design process and its outcome. Overall, students' reactions indicate that they perceived the studio as a space with its culture, atmosphere, and sociality, inseparable from architectural production. Although online tools created new ways of designing for

students, limited access to physical modelling and spatial experiments altered the outcomes produced in online studio education. In the last section of the survey, students were asked about their overall feelings. Based on students' responses, online education was seen as a temporary solution but was not preferred. The challenges they have faced and the lack of essential elements of the physical studio environment have led students to prefer the traditional architectural studio. The survey findings suggest that the online studio enabled students to maintain continuous education during COVID-19; however, it did not fully replicate the traditional studio environment. The traditional studio environment included spatial experiments, sociality, and interaction, which created a studio culture. The survey revealed not only the limitations of the online studio but also the significance of studio culture, which was not valid in the online studio environment.

CHAPTER 5
FINDINGS, OUTCOMES, AND COMPARISONS

The thesis explored the evolution of architectural design education, focusing on the studio environment, tracing its roots to the École des Beaux-Arts and extending to the digital platforms used during the COVID-19 pandemic. The study examined online design education through articles discussing students' reactive responses to several global surveys conducted during and immediately after the pandemic, and through a further examination of lasting trends in online design education using an additional survey conducted by the author. In the thesis, the studio is not seen merely as a physical space for learning, but as a socio-pedagogical environment with a culture specific to it that cannot be separated from architectural education.

A crucial finding of the thesis is that studio culture has always been an evolving concept, shaped by pedagogical and social values. The earliest form of the studio can be traced to the École des Beaux-Arts and the atelier format.

> Academicians continued to have apprentices to whom they taught their art. An élève of the Academy of Architecture learned to design not there but in the workshop, the atelier, of his master. (Among the changes the Renaissance had brought about, the workshop was no longer at the construction site, the chantier, but had become a studio, an atelier; accordingly drawing became the first skill for the student of architecture to learn.) The student's drawing board was in the atelier, not at the Academy's école. (Drexler et al., 1977, p.62)

The studio was a collective, competitive, and social space rather than a classroom. Students were able to discuss, give feedback, compete, and socialize in the studio space. The studio system at the École des Beaux-Arts included an atelier-concours system. After years of tradition at the École des Beaux-Arts, the Bauhaus transformed the studio model. The collective, competitive space was also a space for experimental practice, observation, failure, the discovery of new potentials, and the exploration of limitations. (Albers, 2013) The integration of a multi-disciplinary attitude, with the help of the Bauhaus, has created today's studio culture. The evolution of this sequence in the Western architectural education tradition also influenced Türkiye, resulting in the emergence of the Sanayi-i Nefise Mektebi under the influence of the École des Beaux-Arts. (Uysal, 2003, p.32) Middle East Technical University (METU) and TED University (TEDU) are two universities in Türkiye with architecture departments that

have been influenced by the Bauhaus ideals and have incorporated studio education into their curricula, making it the primary architectural course. (TED University Department of Architecture, 2015) The contemporary architectural design studio has begun to consistently incorporate peer learning, iterative critique, experimentation, and continuous production within a shared social environment. While studio education evolved over time, an overarching concern in the literature on architectural education is that architecture cannot be learned in isolation. The historical overview provided a comprehensive understanding of studio education and why a face-to-face studio was essential. With the sudden shift to online education following the global emergence of COVID-19, the studio environment changed significantly. The experiences gained in the studio were collectively turned into isolated representations on a screen. The loss of the face-to-face studio affected the core of architectural learning. With the shift to online platforms, the studio became an isolated space with limited opportunities to experiment, observe, make, and communicate. In addition to the limitations previously addressed by face-to-face studio education, there were limitations inherent in online platforms and technical issues.

The thesis explored the sudden change in studio education during the COVID-19 pandemic through analyses of global surveys. According to the UNESCO/UIA Charter for Architectural Education, the qualities of architectural education are defined. By considering these qualities as the basis for the study, the surveys selected from regions around the world were examined both individually and collectively. The United States of America, the United Kingdom, the United Arab Emirates, Malaysia, and Türkiye were selected as case studies to examine students' perceptions of the sudden changes in architectural design education during the COVID-19 pandemic.

The radical transformation in architectural design education can be examined across multiple aspects in regions worldwide. To fully understand the global commonalities, the outcomes of the TED University, Department of Architecture survey conducted by the author should be situated within a broader comparative framework. The international case studies provide a rich background for comparison with the thesis. The outcomes of surveys included both difficulties and advantages, as well as regional differences in online architectural design education.

There were many similarities between the surveys' outcomes and the questions students answered. However, studio culture was a central concept consistently emphasized in the surveys. The studio has never been merely a physical space but rather a complex set of social, pedagogical, and spatial relations. Continuous peer interaction, feedback, shared working systems, peer learning, spontaneous critique, observation of peer work, comparison, and juries are among the aspects that shape the studio culture. The sudden transition to an online system for architectural education weakened the studio's impact on students. In all surveys, one of these aspects is asked of the students. In the United States of America, the case study conducted by Nduom and Ferdous highlighted the loss of studio culture as a challenge for students. Nearly 92% of students (22 of 24) identified studio culture as a challenge during the COVID-19 pandemic. (Nduom & Ferdous, 2021) The survey in the United Kingdom included a comment section focused on the design studio's integral role. In this section, many comments addressed studio culture. "Doing architecture cannot be done virtually, to practice architecture is to physically connect, create, discuss which cannot be imitated virtually. Nothing can replace the atmosphere of a review/ studio/ show where chance encounters between years and staff can take place." (Grover & Wright, 2023, p.1183) Another student who answered the question stated that:

> I find it really concerning that remote working for architecture degrees may continue for longer than necessary. It works for lectures but definitely not for studio reviews and tutorials. The lack of contact with other students and tutors is a major disadvantage in my opinion. We students simply don't have the facilities or space at home to complete and architecture project.…Also working remotely with minimal contact with other students is a massive cause for concern particularly when regarding students' mental health (on top of the already existing issue of degrees of architecture's negative affect on mental health). (Grover & Wright, 2023, p.1183)

Another student explained the lack of studio culture as follows:

> To stress, the studio as a physical space and the amenities that it comes with are CRUCIAL to my architectural education. Present standards of remote working have had a serious negative impact on my current and future architectural education…Communication and collaboration are critical conditions in Architecture, how is this supposed to be achieved in isolation? (Grover & Wright, 2023, p.1183)

In the survey conducted in Malaysia, the effect of studio culture was examined in relation to the efficiency in performing studio work at home. While over 20% of the students stated it was poor, nearly 40% explained that they found it fair, and less than

5% of the students found it excellent. (Mervyn Hsin et al, 2023) The survey conducted by the author at TED University sought to examine studio culture using numerous questions. Were you satisfied with the interaction with your peers' works during the online studio environment? It was a question that examined studio culture from the peers' perspective. While 42.9% reported satisfaction with the interaction, 33.3% were neutral, and 14.3% strongly disagreed. The second question related to studio culture was: "Did you have sufficient opportunities for collaborating with peers during the distance education?" Students responded again, with 42.9% agreeing. However, neutral opinions declined and were replaced by disagreement, with 28.6% and 9.5% strongly disagreeing. The third question was "Do you think the working environment affects your learning process in architecture?" 57.1% of students strongly agreed, and 38.1% agreed. There were no disagreements or strong disagreements, which shows that the students thought the studio environment affected their design process and the outcome of that process. Studio environment, including not just the physical aspect, but the socio-pedagogical part, which is the studio culture, affected their design process as well as the design outputs. As evidenced by global surveys, studio culture is a universal aspect of design studios. A design studio without a studio culture does not ignite the design process, creativity, or peer interaction. The transition to an online studio environment has affected students globally due to significant changes in studio culture, and the online environment cannot replicate the studio in all its aspects. (Figure 49)

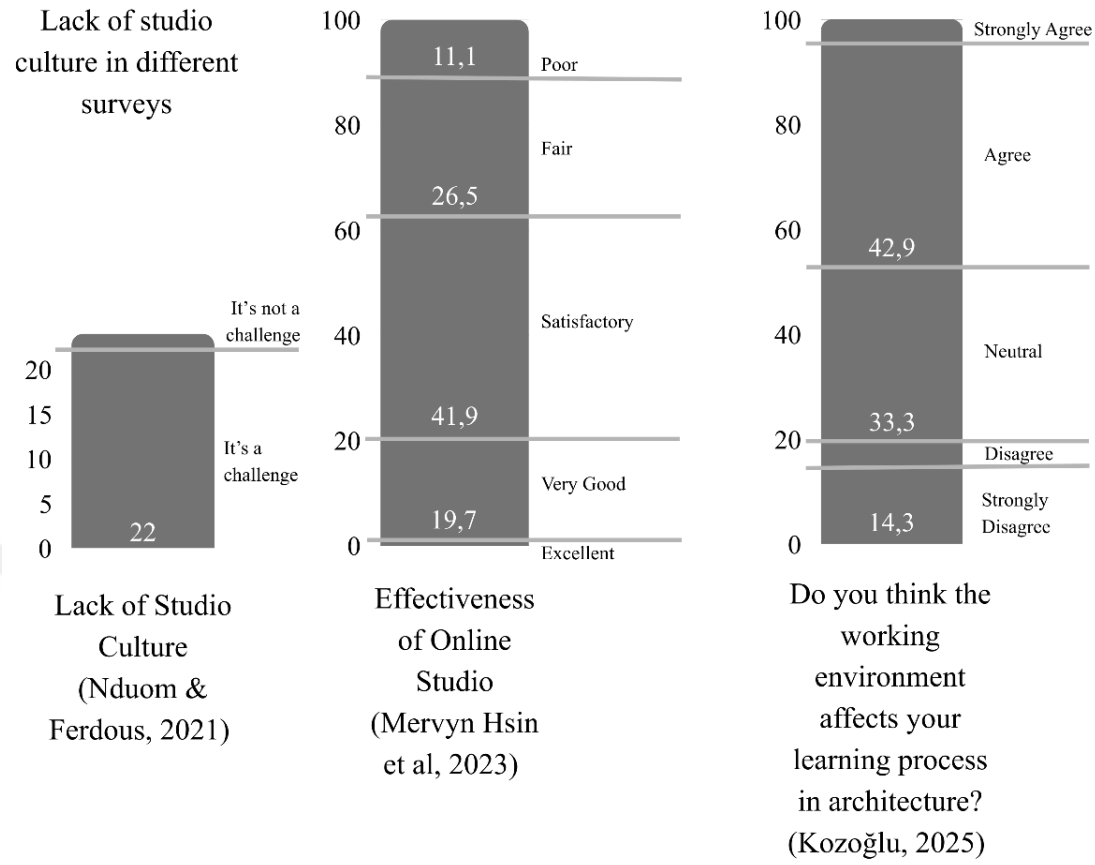


Figure 49.

Lack of studio culture, comparison of different surveys. Tables drawn by the author.

Across all global surveys, students reported a lack of peer interaction, a key feature of a design studio. Students reported that, due to limited peer interaction, they were unaware of their peers' work, could not observe their peers' design processes, and received insufficient feedback on their own design process. The survey conducted in the United States of America by Ndoum and Ferdous asked about peer interaction under the challenges section with the statement "Ability to share resources/knowledge with other students." (Nduom & Ferdous, 2021) The outcome of the question was 16/24, which is approximately 66.67% of students who reported that sharing resources and knowledge with peers was a challenge. The survey conducted by Grover and Wright in the United Kingdom asked about peer interaction in a more detailed way, with statements such as "seeing the work of students, advice from students, technical help from students, sharing resources, observing other students teaching, and working in a team." (Grover & Wright, 2023) Across all statements, the ratio in the face-to-face

studio decreased substantially in the online studio education. The survey conducted in Türkiye by Pekdaş and Kutsal asked students the following statement: “I examined and was aware of the peer works.” (Pekdaş & Kutsal, 2021) The answers included 32% strongly disagreement and 27% disagreement. The survey conducted by the author at TED University included a section on peer interaction that contained several questions. Overall, responses regarding peer interaction were neutral most of the time; strong agreement was infrequent, and strong disagreement was rare. Across all these surveys, it is clear that percentages and perceptions of peer interaction varied by region and method of online studio education; peer interaction decreased sharply throughout the design process. (Figure 50)

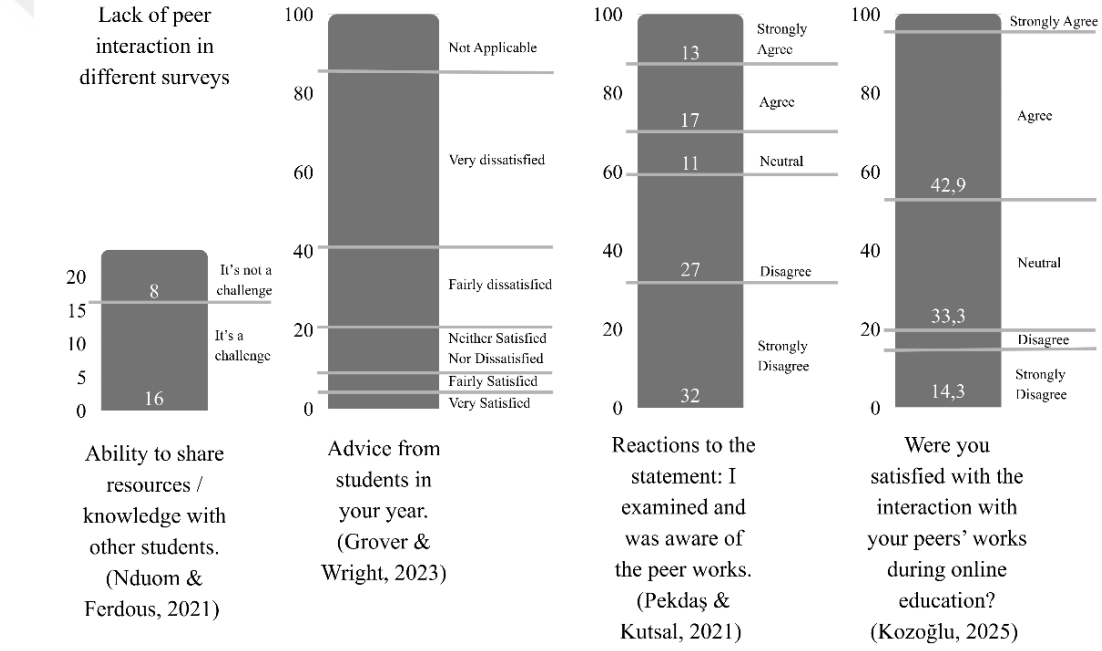


Figure 50.

Lack of peer interaction, comparison of different surveys. Tables drawn by the author.

Digital skills and technical adaptation were another common issue highlighted across the surveys compared. While some students found this issue positive, others saw it as a major reason the studio was not efficient enough. While internet connectivity and access to technology were seen as challenges in the United States of America survey, the new innovative technology was seen as an opportunity. (Nduom & Ferdous, 2021) The survey conducted in the United Arab Emirates highlighted the association between technical adaptation and students’ mental health issues, with responses such as “Face

difficulties while working on my project." Freshman students: 25.7% answered "often," and 36.4% said they sometimes faced it. Although the ratio decreased, senior students also reported difficulties, with 17.3% often and 30.8% sometimes. (Amro, 2022) A survey conducted in Malaysia found that internet connectivity problems were a significant issue for both lecturers and students, as instructors had to provide private critiques at times when students could connect. In addition to that, internet accessibility, digital competence in access to technological gadgets were also asked to students, and "55% of the students explained that they were not very confident in their level of digital competency during online learning." (Mervyn Hsin et al, 2023) The survey conducted at TED University included an open-ended question on technical adaptation: "During distance education, did you face any challenges while working on your designs?" It was expected that the students who faced challenges would explain and categorize them. As expected, the challenges students reported were primarily technical in nature during online studio course hours. (Figure 51)

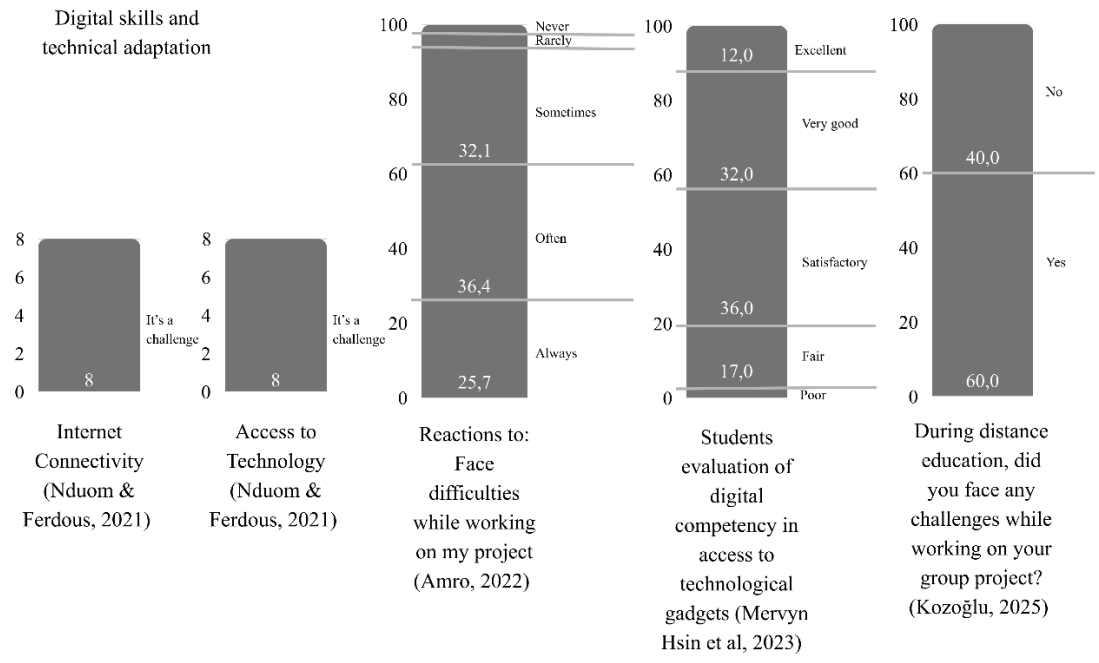


Figure 51.

Digital skills and technical adaptation, comparison of different surveys. Tables drawn by the author.

Although the students preferred to highlight the negative impacts of the online studio, the rapid changes in the education system also created new opportunities for them. For

most students, it was an opportunity to have guest critics from outside the city, or even the country. In the online environment, the notion of distance disappeared, and everyone was on the same ground. In this regard, guest critics who could not be available to give face-to-face lectures due to distance, location, diplomatic, or time constraints were able to attend and deliver online lectures about their profession. In the United States of America, 15 out of 16 students saw engaging with guest critics outside the city as an opportunity to have, and the survey conducted at TED University found that 61.9% were satisfied with the additional lectures. (Figure 52)

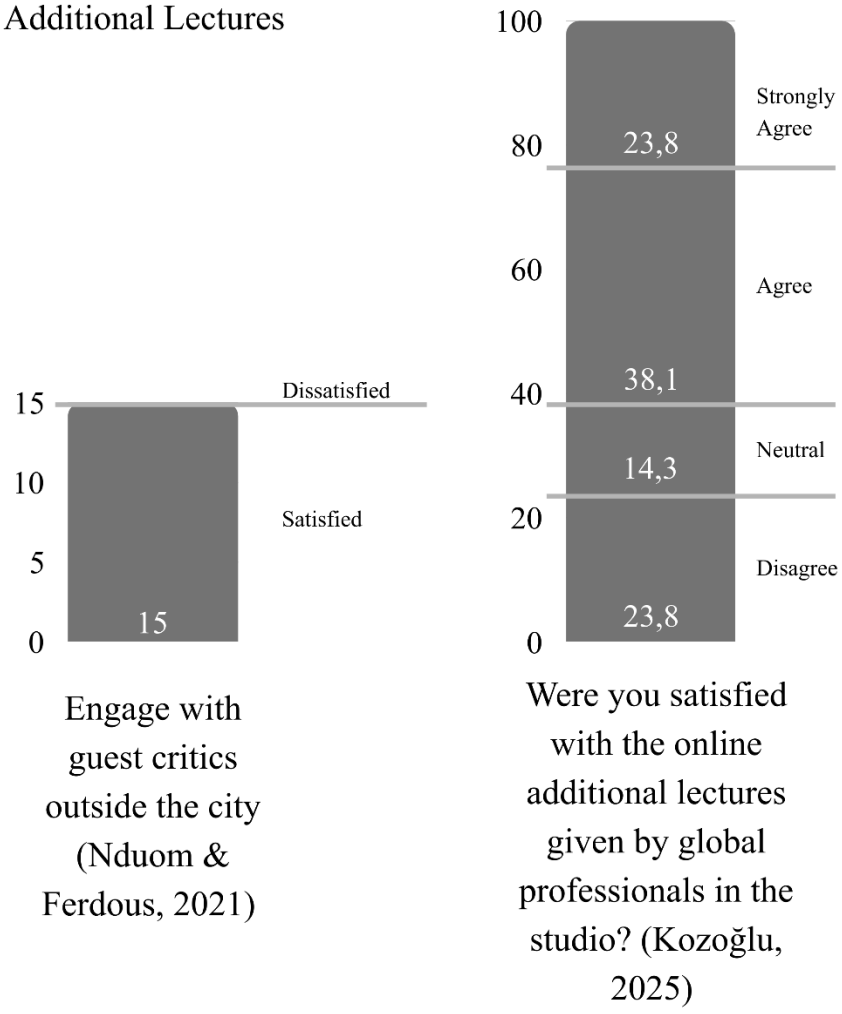


Figure 52.

Students' reactions to additional lectures by professionals outside the university. Tables drawn by the author

Another common question in the surveys asked students to explain their preferences for the online studio over the traditional face-to-face design studio. The overall

experience was not a single question, but a summary of what students perceive from online studio learning. According to the survey in the United States of America, when asked about their overall evaluation, only 17% of the students were satisfied with online design education. 38% were dissatisfied, 45% were neutral about online education, and only 10% said they would like to pursue online design education in the coming years. (Nduom & Ferdous, 2021, p.381) The survey conducted in Malaysia directly asked students about their preferences. While 81.1% preferred a face-to-face design studio, only 18.9% of students preferred online education. (Mervyn Hsin et al, 2023) When the Turkish case conducted by Pekdaş and Kutsal is evaluated, the question "Distance learning is a more effective method than face-to-face training for architectural Design Studio courses" is raised. While 31% strongly disagreed, 27% disagreed, and only 13% strongly agreed that online education was a more effective method for architectural design education. (Pekdaş & Kutsal, 2021) The survey conducted at TED University also asked students directly about their preferences. While 76.2% of students selected face-to-face design education, only 23.8% selected online education. Therefore, globally, the proportion of students choosing the face-to-face studio is much higher than that of online education. Across all surveys, nearly 20% of students chose online education, whereas the remainder found face-to-face studio instruction more effective. (Figure 53)

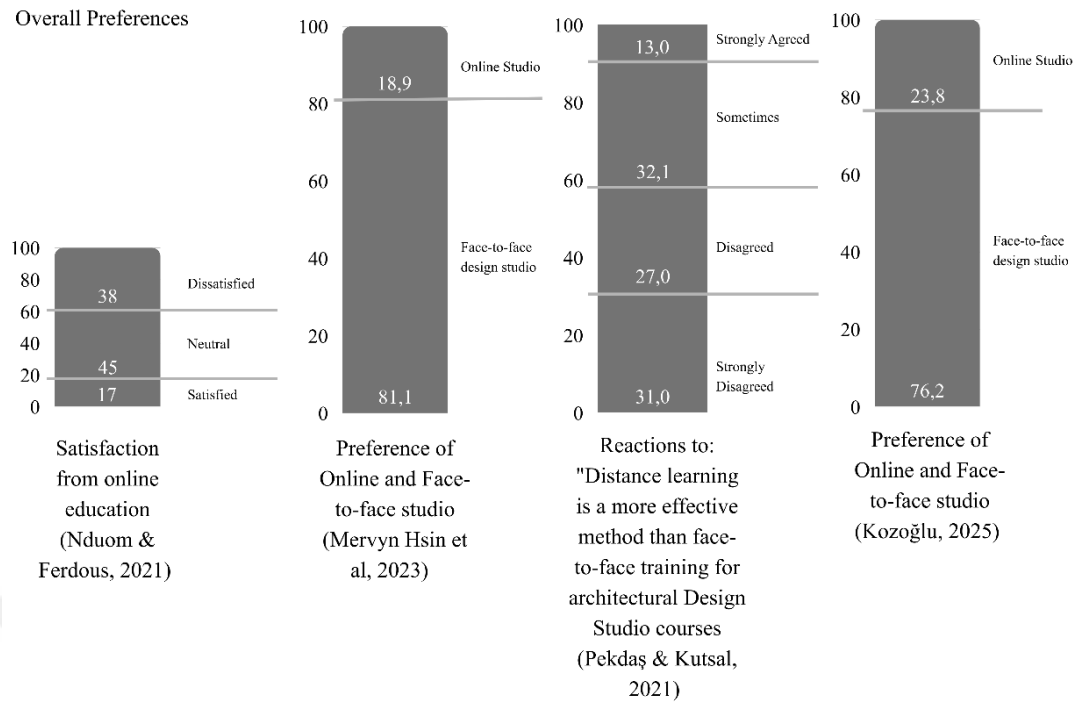


Figure 53.

Overall preference of online and face-to-face studio, comparison of different surveys. Tables drawn by the author.

The thesis examined the architectural design studio as a core of architectural education. The thesis did not consider the studio as a physical space but as a complex educational system with socio-pedagogical aspects. The historical roots of the architectural design studio were traced, and the sudden changes in the education system due to the COVID-19 pandemic were examined in relation to this historical context. Historic tracing includes the École des Beaux-Arts, the Bauhaus, and local steps toward institutional architectural design education in Türkiye. The COVID-19 impact on design education was analyzed through global surveys of architectural design education conducted during the pandemic, in which students participated. The surveys were chosen from different regions to create an international framework for the reader. Despite some geographical differences, the global surveys indicated that the effects of the COVID-19 pandemic on architectural design education were similar across countries. Although online studio education was often viewed as a disadvantage, some surveys also identified positive aspects of online education. The latest survey conducted by the author has captured the long-lasting effects of the pandemic on students' perspectives,

allowing readers to gain a comparative and comprehensive view of online design education.

There were regional and specific details that differed in all case studies. Because of the technical abilities of students at TED University, students were not much affected by the sudden change in the education system and kept up fast with synchronous online education. Other universities in Türkiye struggled to keep up and had to adopt asynchronous education.

When the thesis is examined as a whole, it can be stated that the loss of studio culture could not be replicated through an online system; therefore, there were gaps in architectural design education during the COVID-19 pandemic. The study argues that the architectural design studio is a socio-cultural phenomenon vital to design education and cannot be replicated in an online system. The thesis underlines that, rather than relying solely on online education, even during a pandemic, design education should be synchronous and enable students to be part of the whole studio in a hybrid model. The COVID-19 pandemic revealed the vital aspects of architectural design education, especially highlighting the studio culture. The thesis offers conjectures for reconsidering the studio environment in architectural design education, especially during and after the pandemic.

CHAPTER 6
CONCLUSION: SIGNIFICANCE OF STUDIO CULTURE AND PEER LEARNING

The thesis examined the architectural design studio as a socio-pedagogical environment in architectural education, tracing its historical evolution up to the sudden transformation caused by the COVID-19 pandemic. By examining students' experiences, the study explored how spatial, social, and pedagogical changes in the studio environment affected the design process, with a focus on peer learning and studio culture over the years.

For years, even as architecture itself has changed, the way architectural design education is conducted has remained the same. The physical layout of the studios is nearly the same as at the École des Beaux-Arts, with large drafting rooms with natural light that serve as a collective space. The thesis is examined through two main global pillars of the studio: peer learning and the studio culture. While pedagogical methods, approaches, and representational tools have evolved, the main logic behind architectural education has relied on shared physical space, which has made it easier to work collectively through peer-learning systems. Even though the students' genders, abilities, and methods of conducting the studio have changed over time, the physicality of the architectural studio has remained. The studio always functioned as a social spatial framework where architectural knowledge was also transmitted through various talks with peers. Up until the COVID-19 pandemic, physical adequacy had not changed; however, with the sudden shift in the system, physical appearance in architectural education lost its meaning. The COVID-19 pandemic was the first time the physical environment had completely detached from architectural education since its emergence. The sudden absence of the studio environment showed what really depended on the physical studio, not only as a spatial quality but as a cultural and social identity of the studio, which supported the peer learning and collective design processes. Based on surveys conducted at TED University and global articles, it can be stated that collectivity and peer learning did not disappear with the loss of the studio's physical space; they simply took on new forms. Synchronous education at TED University enabled the continuation of communication, peer learning, critique,

collaboration, and eventually the studio culture. The design process continued, and critiques were conducted on the digital platforms. Peer learning was not eliminated; it was transformed and adapted into the online learning system. Even though there were disruptions in communication, as the students stated in the survey, the studio culture and peer learning remained. This continuity underlines that the essence of studio education does not rely only on the spatial quality of the studio but on continuous communication, experimentation, and adaptability.

When the studio traditions are examined altogether, starting with Ecole des Beaux-Arts, the Bauhaus, Middle East Technical University, and TED University, it becomes clear that the studio has functioned as a physical space with some distinct qualities that reinforced the peer learning, collective production, and continuous learning-design process. In the Beaux-Arts system, the atelier was a collective environment where students learned together, attended competitions, and learnt under the 'patrons' in large drafting rooms with large windows. (Drexler et al., 1977) Even though the Bauhaus transformed the methodology of architectural design studio and education, the physical environment of the studio and continuous peer learning maintained itself within the studio. The continuous peer interaction in the early forms of the studio reinforced the idea of architectural design education as a social and spatial process. This understanding of architectural design education eventually influenced Türkiye, where architectural education was beginning to be rationalized in line with the earliest forms of studio at the École des Beaux-Arts and the Bauhaus. One of the earliest representations was at Middle East Technical University. As it was stated by Yüksel, "the school established its system of architectural education with reference to the American extension of the Bauhaus program." (Uysal, 2003, p.82) Therefore, it can be stated that the studio environment and the importance of continuous peer learning, learnt from the Bauhaus system, were adapted to Türkiye's local and cultural context. Similar to the Bauhaus's spatial qualities, the design studios at METU were large drafting rooms where students could work together, listen to critiques, and collaborate. TED University's architectural education also holds a similar position to METU. As stated in TED University's studio handbook, the Bauhaus heritage was acknowledged but adjusted accordingly. (TED University Department of Architecture, 2015, p.6) It can be stated that even the locality, context, and methodology have changed over the years across various locations of architectural design education, peer learning, and

studio environments, while studio culture has remained the same, providing the basis for design education.

The sudden transition to online studio education during the COVID-19 pandemic represented a significant point for design education. For the first time since the emergence of design studios, a physical studio was completely detached from the educational process. However, this rapid change did not affect the studio pedagogy. Online platforms made it possible to connect simultaneously, allowing students to keep up with peer learning, critique, and a collective work environment. Even though the studio's physicality had changed radically, its essence remained significant.

The articles from different regions and the survey conducted by the author at TED University were analyzed in terms of these global aspects of the studio: studio culture and peer learning. Through this comparative approach, the architectural studio was seen not as a locally bounded educational space but as a framework encompassing global approaches, common values, practices, and challenges. Despite differences in geographical and technological infrastructure, the studio's role as a collective learning environment remained the same. This idea underlined that studio culture and peer learning are not accidental features but the fundamental components of architectural design education, regardless of the regional and temporal boundaries.

In this context, the architectural studio can be understood as a spatial area with a socio-cultural framework. Without the physical studio itself, the culture and peer learning process found a new way to represent themselves and adapt to the online system. The face-to-face studio created an environment where learning continued even after the studio lecture. While the studio's historic examples provided conditions for collective learning and a continuous design process, the COVID-19 pandemic transformed the spatial environment into a virtual one. By disrupting the studio's spatiality, interactions were also restricted; however, with the support of synchronous interaction methods, peer interaction found its own representation in the digital world.

The thesis focused on the rapid change during the COVID-19 pandemic, through the foundational elements of studio education: studio culture, environment, and peer interaction. The thesis examined the historical foundations of architectural design education, both globally and locally, up to the rapid changes caused by the COVID-19 pandemic. Global articles and analyses that feature students' surveys on architectural

design education during the COVID-19 pandemic are analyzed and compared to provide a comprehensive view of the subject. To gain a local insider's view, a survey was conducted at TED University among 3rd-year students in the 2020-2021 academic year. The comparisons revealed that both the positive and negative impacts of the COVID-19 pandemic were evident across regions worldwide, regardless of context or content. It showed that regardless of the methodological, theoretical, time, or spatial qualities change, the ethos of architectural design education was common around various regions. The study contributes to the field by framing the COVID-19 pandemic not as a temporary change but as a critical moment that exposed the foundations of the architectural design studio: peer learning and studio culture.

The thesis opens various possibilities for future research. While the COVID-19 pandemic showed that the studio environment can adapt itself to an online platform, it underlined the importance of a physical design studio, continuous peer interaction, and studio culture. Future research may further investigate how online studios influence studio design outcomes through comparative studies of students' work across different cultural contexts. It could also focus on how the hybrid studios would be redesigned to strengthen the studio culture. Ultimately, future studies should explore the evolution of the design studios with respect to technological and spatial transformations while preserving the socio-cultural foundations of architectural education.

To conclude, the thesis aimed to situate online learning during the COVID-19 pandemic within historical examples to understand how spatial change affects student work and the design process. The thesis contributes to discussions on how studios might continue to evolve in the digital world without losing their identity, including the social and cultural qualities that have defined architectural design education since its earliest forms.

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APPENDICES

APPENDIX A: Survey conducted at TED University in Türkiye by the author

The Effect of Studio Environment on Architectural Design Education

Section 1. Studio Processes

In this section you are going to answer questions about distance education online studio processes.

Do you think having two days of online studio courses per week was sufficient?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Do you think the duration of the online studio courses was sufficient for receiving critiques and developing your project?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly Disagree

Were you satisfied with the content of the studio?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Were you satisfied with the format of the studio? (Please think about Zoom and other programs such as Moodle 'LMS' that were used to conduct online studio)

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Do you think the amount of feedback time provided by studio professors was sufficient for the design phase?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Were you satisfied with the online additional lectures given by global professionals in the studio?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

During distance education, did you face any challenges while working on your designs?

If yes, could you please explain on the next question.

- ○ Yes
- ○ No

During distance education, did you face any challenges while working on your designs? If yes, please explain.

Yanıtınız

Section 2. Online Group Works

In this section, you are going to answer questions about online group works. If you have not done any online group work for studio during 2020-2021 semesters please skip to Section 3.

Were you satisfied with the progress of group work in the online studio environment?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Were you satisfied with the outcome of the group work during the online studio environment? ?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

During distance education, did you face any challenges while working on your group project?
If yes, could you please explain on the next question.

- ○ Yes
- ○ No

During distance education, did you face any challenges while working on your group project? If yes, please explain.

Yanıtınız

Would you prefer working in a group in online studio environment or face-to-face studio environment?

- ○ Online studio environment
- ○ Face-to-face studio environment

Section 3. Peers

In this section, you are going to answer questions about your peers in online studio working environment.

Do you think peer feedback affects the final product in architecture?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Were you satisfied with the interaction with your peers' works during online studio environment?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Did you have sufficient opportunities for collaborating with peers during distance education?

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Were you satisfied with advice and help from your peers in the design studio during online studio learning?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Were you able to share resources with your peers on the design phase during online studio environment?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Section 4. Products of Distance Education

In this section, you are going to answer questions the products you have designed during online studio working environment.

Do you think the working environment affects your learning process in architecture?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Do you think the working environment affects the quailty of the final product in architecture?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Did the tools or resources available during distance education influence your final product?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strobgly disagree

Do you think that your creativity was enhanced during distance education compared to face-to-face studio working environment?

- ○ Strongly agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

Section 5. Overall Evaluation

In this section, you are going to answer questions about your overall evaluation of distance education.

Would you prefer to study in distance education online studio environment or face-to-face studio environment?

- ○ Distance education - online studio environment
- ○ Face-to-face studio environment

Would you recommend distance education - online studio environment for future architecture students?

- ○ Strongly Agree
- ○ Agree
- ○ Neutral
- ○ Disagree
- ○ Strongly disagree

APPENDIX B: Ethics Committee Approval

TED ÜNİVERSİTESİ
İNSAN ARAŞTIRMALARI ETİK KURULU
ETİK KURUL KARARLARI
Sayı: 2025-48 Tarih: 25/04/2025

Toplantı Sayısı:	2025-48
Toplantı Tarihi ve Saati:	25 Nisan 2025 Saat: 10.00
Toplantı Yeri:	Zoom üzerinden yapılmıştır.
Katılanlar:	Dr. Öğr. Üyesi Kıymet Duygu ERDAŞ – Başkan Dr. Öğr. Üyesi Burcu ALTIN – Raportör Dr. Öğr. Üyesi Duygu Onay ÇÖKER - Üye Dr. Öğr. Üyesi Çağla Öneren ŞENDİL - Üye Dr. Öğr. Üyesi Şule AKDOĞAN KILINÇ- Üye Dr. Öğr. Üyesi Kübra ÇELİKDEMİR - Üye Doç. Dr. Beril Türkoğlu DEMİREL – Üye
Raportör:	Dr. Öğr. Üyesi Burcu ALTIN

GÖRÜŞME MADDELERİ :

G.06 : TED Üniversitesi, Mimari Tasarım Tezli Yüksek Lisans Programı öğrencisi Zeynep Kozoğlu tarafından Mimarlık Bölümü Dr. Öğr. Üyesi Onur Yüncü danışmanlığında yürütülen "The Effect of Studio Environment on Architectural Design Education" başlıklı çalışmasının araştırma etiğine uygunluğu görüşüldü.

Karar 2025-48/06 : TED Üniversitesi, Mimari Tasarım Tezli Yüksek Lisans Programı öğrencisi Zeynep Kozoğlu tarafından Mimarlık Bölümü Dr. Öğr. Üyesi Onur Yüncü danışmanlığında yürütülen "The Effect of Studio Environment on Architectural Design Education" başlıklı çalışmasına,

ONAY KARARI VERİLDİ.

Toplantı saat 12.00 de sona erdi.

TED ÜNİVERSİTESİ
İNSAN ARAŞTIRMALARI ETİK KURULU
ETİK KURUL KARARLARI
Sayı: 2025-48 Tarih: 25/04/2025

e-imzalıdır
Dr. Öğr. Üyesi Kıymet Duygu ERDAŞ
Başkan

e-imzalıdır
Dr. Öğr. Üyesi Burcu ALTIN
Raportör

e-imzalıdır
Doç. Dr. Çağla Öneren ŞENDİL
Üye

e-imzalıdır
Doç. Dr. Beril Türkoğlu DEMİREL
Üye

e-imzalıdır
Dr. Öğr. Üyesi Duygu Onay ÇÖKER
Üye

e-imzalıdır
Dr. Öğr. Üyesi Kübra ÇELİKDEMİR
Üye

e-imzalıdır
Dr. Öğr. Üyesi Şule AKDOĞAN KILINÇ
Üye