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Distance Learning under the Covid-19 Conditions within Architectural Education

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Distance learning is one of the means of education used in various levels, from primary school to college. However, distance learning in architectural education differs from other disciplines, as architectural education is design-based with predominantly applied courses. As the spring semester of the 2019/20 academic year had to continue online due to the Covid-19 pandemic and it remained uncertain whether or when face-to-face (FtF) education will start till the end of the term, the necessity to focus on online education suddenly raised in architectural faculties.
This study aims to start a discussion on how to proceed with online architectural education, focusing on quality, defining the fundamentals, and proposing suggestions within this scope. In order to achieve this aim, research on the evaluation of the existing distance learning platforms of universities, the differences between the implementations of theoretical and applied courses, the advantages and disadvantages of the process are made. For this purpose, a comprehensive literature review on universities that provide fully online, hybrid and conventional (FtF) education throughout the world is conducted, given and discussed in the paper. After the research on ongoing processes, a case study to determine the experiences, opinions and approaches of students and academic staff with the scope of emergency remote teaching is designed and conducted. Together with the findings of the review and the case study, the challenges, strengths and opportunities of online architectural education are discussed and evaluated with a focus on maintaining and raising the quality of the education. In conclusion, suggestions and proposals are made and presented to be applied and developed in architecture faculties' future online education experiences.

Keywords: Covid-19, distance education, architectural education, emergency remote teaching

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Učenje na daljavo v arhitekturnem izobraževanju med covidom-19

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Učenje na daljavo je eden izmed načinov izobraževanja, ki se uporablja na različnih ravneh, od osnovne šole do fakultete. Učenje na daljavo v arhitekturnem izobraževanju pa razlikuje od drugih disciplin, saj temelji na oblikovanju s pretežno praktičnimi predmeti. Ker se je moral pomladni semester študijskega leta 2019/20 zaradi pandemije covida-19 nadaljevati na daljavo in je bilo do konca semestra negotovo, ali in kdaj se bo začelo konvencionalno izobraževanje oz. izobraževanje na fakulteti (Face-to-Face), se je na fakultetah za arhitekturo nenadoma pojavila potreba po osredinjanju na izobraževanje na daljavo. Namen raziskave je začeti razpravo o tem, kako nadaljevati spletno arhitekturno izobraževanje, s poudarkom na kakovosti, opredeliti temelje in oblikovati predloge v tem okviru. Da bi dosegli ta cilj, so bile izvedene raziskave o vrednotenju obstoječih univerzitetnih platform za učenje na daljavo, razlikah med izvedbami teoretičnih in praktičnih predmetov ter o prednostih in slabostih postopka. V ta namen je bil v prispevku opravljen obsežen pregled literature o univerzah, ki izvajajo popolnoma spletno, hibridno in konvencionalno (Face-to-Face) izobraževanje po vsem svetu. Po raziskavi procesov v teku je bila zasnovana in izvedena študija primera, da bi ugotovili izkušnje, pristope ter mnenja študentov in akademskega osebja o obsegu poučevanja na daljavo v izrednih razmerah. Skupaj z ugotovitvami pregleda in študije primera so bili obravnavani in ovrednoteni izzivi, prednosti in priložnosti arhitekturnega izobraževanja na daljavo s poudarkom na ohranjanju in dvigu kakovosti izobraževanja. V sklepu so podani predlogi, ki bi jih lahko uporabili in razvili v prihodnjih izkušnjah izobraževanja na daljavo na fakultetah za arhitekturo.

Ključne besede: covid-19, izobraževanje na daljavo, arhitekturno izobraževanje, poučevanje na daljavo v izrednih razmerah

Introduction

Education has experienced a transformation with the impact of globalisation and technological developments. Distance learning, which has two types, synchronous and asynchronous, came into our lives due to the computer age, the value of time, the marketing of products and the availability of online services. Although asynchronous distance learning has been available since the 1700s, synchronous distance learning began with the integration of web-based systems into our lives.

In addition to this, distance learning programs in various disciplines are available in the curricula of many universities. However, distance learning in architectural education is always challenging because architectural education is design-based with predominantly applied courses and a master-apprentice relationship is the foundation of architectural education.

Spreading from Wuhan, China, in December 2019, Covid-19 quickly became a pandemic; it is affecting the whole world, dragging us towards a new world order. As a part of measures taken against Covid-19, the spring semester of the 2019/20 academic year in all levels had to be continued online in Turkey, as in many other countries.

In this context, this study aims to start a discussion on how to conduct online architectural education, focusing on quality, defining the fundamentals, and proposing suggestions within this scope.

Distance Learning and Covid-19

Distance learning occurs when students and instructors are physically separated. The history of the concept of distance education goes back to the 1700s. A newspaper advertisement about stenography, issued by Caleb Phillips on 20 March 1728, has been cited as the first example of distance learning (Erthal & Harting, 2005). Although it is unclear whether this course was actually given, it is known that the students and the instructors reached out to each other and students were graded. According to the official sources, the acceptance as the first distance learning was a correspondence stenography course that Isaac Pitman gave in 1840. Subsequent correspondence courses were in Germany in 1856, the US in 1877, Sweden in 1889, Australia in 1910, New Zealand in 1922, Poland in 1966 and Spain in 1972 (Kaya, 2002).

In Turkey, even though some proposals about distance learning had been presented by the National Education Council in the 1920s, the first concrete step, the Correspondence Courses Centre to teach vocational and technical

education, a body of the Ministry of National Education, took place in 1961. The first permanent and regular implementation of distance learning was the 'School of Open Education', established in 1983, within the body of Anadolu University (Celik, 2017).

Today, distance learning is given in two ways as synchronous and asynchronous. In asynchronous distance learning, there is no time limit because the students and instructors do not have to be available simultaneously. Instead, the students take the courses through alternative materials such as e-mails and open courseware. These materials provide a model for accessible communication. The synchronous learning environment is structured in the sense that students attend live lectures, and there are real-time interactions between educators and learners (Dhawan, 2020).

Covid-19 spread out from Wuhan, China in December 2019 and was declared a pandemic on 11 March 2020 by the World Health Organization. The Turkish government took measures against Covid-19, such as closing educational institutions and switching the education system from face-to-face (FtF) to online, as in many other countries. In public primary, middle, and high schools, education continued through the digital education platform of the Ministry of National Education, both online and featured on the state's official TV channels. Private schools mostly used their own infrastructure and distance learning platforms for online education. Universities made the transition to distance education quickly and extemporaneously by using their existing distance learning platforms. Thus, distance learning, which had been predicted for the coming decades, occurred in a few weeks instead.

This situation happened to be the same nearly for all students and instructors. However, students who have different conditions perceived and experienced this situation differently. Distance learning has some advantages and disadvantages for students with various disabilities. Before the pandemic, some models supported equal opportunities in education. The Universal Design for Learning, which originates from North Carolina State University, is an example of this subject. It is a way of thinking about teaching and learning that helps give all students an equal opportunity to succeed. It is based on three main principles (Morin, 2014).

Representation: offering information in more than one format. Providing not only textbooks but also video, audio and hands-on learning.

Action and expression: giving the students more than one way to interact with the material and show what they have learned. For example, students might get to choose between taking a pencil-and-paper test or giving an oral presentation.

Engagement: Universal Design for Learning encourages teachers to look for multiple ways to motivate students. Letting the students make choices and giving them assignments.

Universal Design for Learning principles focus on the design of flexible, inclusive and student-centred educational environments to ensure that all students have access to and benefit from course materials, activities and assignments. In parallel with the Universal Design for Learning principles, the Council of Higher Education in Turkey stated that 'small changes have big meanings' and made a recommendation to universities on 7 May 2020 to address the problems and experiences of students with disabilities. In this context, it was recommended to give courses with captions for hearing-impaired students and to use large fonts and high-contrast colours in presentations, describing visual contents, graphics and tables during the lessons for visually impaired students (Council of Higher Education, 2020). However, it can easily be said that distance architectural education for students with different conditions requires a more detailed and complicated study and arrangement.

The General Framework of Architectural Education

Architectural education differs from other disciplines as it is design-based with predominantly applied courses. Design studios are the main classes for teaching design skills to future architects (Tekeli, 2014). Architectural education is a process that has design studios at its centre, supported by compulsory courses and a wide range of elective courses, ending with a thesis project and professional practice (see Figure 1).

Figure 1
Courses in architectural education

Note. Adapted from Eweda & Gonim, 2018.

In addition to the courses taken in the university, seminars, workshops, social and cultural activities, and site visits are an important part of architectural education. As mentioned, 'The architect should be equipped with the knowledge of different disciplines and various teachings' in the Ten Books of Architecture, written by the Roman architect Vitruvius (90–20 BC). Hence, architectural education has been and remains supported by other disciplines, and theoretical and social aspects exist within them. Students and instructors are in a one-on-one relationship in architectural education, and the instructor examines each project. As a result, architectural education is beyond the FtF education by nature, unlike many other disciplines. The one-on-one relationship between student and instructor is a reflection of a traditional master-apprentice relationship.

Traditional Design Studios

The concept of the design studio is based on the French Royal Academy and continued with the Ecole des Beaux-Arts (Bender & Vredevoogd, 2006). It became traditional for schools to have the studio as the centre of the curriculum. Design studios, where drawing, modelling, debate, and design analysis

take place, are considered more of an active learning experience than a lecture-style classroom (see Figure 2).

Figure 2
Traditional design studios

Note. Sungur archive.

In traditional design studios, there are 12 to 24 students per instructor, depending on the department's capacity. On certain days of the week, students show their projects individually to the instructor and continue their studies according to the critique given. Traditional design studios provide a working environment for students where they generally remain passive, take notes, listen and work on their projects in line with the critiques (Sagun et al., 2008). It is common for students to wait all day while listening to the critiques given to the other students to receive feedback from the instructor regarding their project. Traditional design studios are necessary for not only the student-instructor relationship but also student-student relationships.

The design jury, which is an open discussion platform taking place once or twice during the semester and once at the end of each semester, continues to evaluate the students' projects throughout the day. Listening to the project comments of each other is a valuable asset for architectural education.

Compulsory and Elective Courses

In architectural education, design studios benefit from compulsory and elective courses. Compulsory courses, which can either be theoretical or applied, are grouped as Building Design and Theory, Building Science and Technology, Restoration and History of Architecture (This grouping is given as an example from Yildiz Technical University in Istanbul). These courses can be considered a contribution to the design studios to provide the rudiments of design to the students.

In addition to compulsory courses, there are elective courses to complement competence. Students can take either area electives or non-area electives to improve themselves culturally, socially and technically. There is a high variety of elective courses as architectural education benefits from many other disciplines. In addition, students support their competencies with elective courses and various activities (panels, film screenings, architectural talks etc.).

Graduation Project

The graduation project is a way to showcase the knowledge and the skills gained during the educational lives of students. During the graduation project, students work independently throughout the semester and do not actively see the instructor for revisions, as in previous semesters; however, some interviews and design juries are held during the semester. The student is expected to work completely individually and afterwards make a presentation of the project. The students' projects are evaluated by the faculty staff and professionals, most of whom are acquainted with project competitions. This jury makes the final decision about whether the creator of the graduation project should be repeated for another term or should successfully graduate from the faculty.

Internship

Internships are required to enhance the knowledge and skills gained in theoretical and applied courses in an architecture program. The aim of an internship is to gain knowledge, ability and experience in office work and construction sites, as well as in interdisciplinary areas related to architecture, such as research, archaeological excavations, restoration and documentation works, and similar. (Yildiz Technical University, 2020). The internship, which has two types (i.e., at either an office or a construction site) is a requirement of graduation in many architecture faculties throughout the world.

While the student experiences being responsible for the project from the design phase to application in the office internship, the construction internship contributes to three-dimensional thinking and enhances the collaboration with other disciplines.

Distance Learning in Architectural Education

Distance learning in architectural education comes as a challenge because of the structure of architectural education. The first virtual design studio studies date back to the 1960s at the University of Illinois (Bitzer, 1986). Other examples of distant learning include college-by-radio at the University of Louisville and televised courses at DePaul University (Ahmad et al., 2020). Although some experimental studies have been made about virtual design studios, the idea that architectural education cannot be given fully online remains dominant. It is appropriate to examine distance learning in architectural education in three parts.

Before the Pandemic

Studio teaching in architecture and design is traditionally based on the presence of both instructors and material learning artefacts. From this triad of students, instructors and learning artefacts, learning emerges. As such, the physical presence of people and materials is a fundamental premise of the traditional studio learning format (Khalid & Steino, 2017). Thus, the idea of fully online architectural education is not prevalent.

When the architecture departments of universities throughout the world are examined, it is seen that:

- FtF education is offered in general;
- Fully online education is preferred in master programmes rather than undergraduate programmes;
- In hybrid learning, students are expected to have basic architectural knowledge as a prerequisite.

Education-type examples of some architecture departments that offer FtF, hybrid, and fully online education are summarised below (see Table 1).

Table 1

Education-type examples of some architecture departments

Name of the University	Country	Degree/ Year	Type	Courses-Requirements	Accreditation
MIT	USA	BSc, 4 Years	FtF	5 Design Studios + Electives + Senior Thesis(Optional)	Accredited by NAAB
Brown University	USA	BSc, 4 Years	FtF	2 Design Studios + Electives + Honours Thesis(Optional)	Not accredited by NAAB
Columbia + Barnard School of Architecture	USA	BSc	FtF	4 Design Studios + 5 Lectures, Seminars & Workshops + 2 Senior Courses + 3 Specialization Courses	Accredited by NAAB
Cornell University	USA	BSc, 5 Years	FtF	10 Design Studios +Non-electives & Electives + Swim Test + Physical Education	Accredited by NAAB
Harvard	USA	M.Arc, 7 Sem.	FtF	5 Design Studios + Non-electives&Electives + Thesis	Accredited by NAAB
The AA	UK	3+2 Years	FtF	Unit (Design Studies) + Technical Studies + Architectural Professional Practice	Accredited by RIBA
Roma Tre University	Italy	3+2 Years	FtF	3 Design Studios + Non-electives & Electives + Final Exam	Recognized by Ministry of Edu.
Athabasca University	CA	BSc, 4 Years	Fully Online	Architectural Major Courses 75 Credits Design Workshop Courses 36 Credits Electives	Accredited by Mid. States Commissions on Higher Education
Academy of Art Uni	USA	BSc, 5 Years	Fully Online	Core Courses + Major Courses + Liberal Arts Electives	Accredited by NAAB
Boston Architectural College	USA	BSc, 2,5 Years	Hybrid (Online Courses + Design Studios)	Prerequisite 2 years college experience in an architecture or design program	Accredited by NAAB
Bircham University	Spain	BSc, 1-3 Years	Fully Online	Program Structure: 100% based on textbooks 60 credits in General Education + 36 credits Architectural Design Online + Other additional subjects	Non-accredited
Catham University	USA	Master Int Arch	Fully Online, FtF or Hybrid	Foundation Courses 12 Credits + Skills Courses 12 Credits + Electives 6 Credits	Accredited by Mid. States Commission on Higher Education
Lawrence Technological University	USA	M. Arch	Hybrid (Online Courses + Design Studios)	32 Credits Online Courses + 4 Credits Design Studios	Accredited by NAAB
Universidade do Porto	Portugal	M. Arch, 5 Years	FtF	5 Design Studios + Non-electives & Electives	Accredited by Min. Of Sci. Tech.&Edu.
Politecnico di Torino	Italy	BSc 3+2 Years	FtF	Design Studios + Construction Studios + Non-electives & Electives + Professional Practice	Recognised by Ministry of Edu.

Name of the University	Country	Degree/ Year	Type	Courses-Requirements	Accreditation
Swiss Federal Institute of Tech, DARCH	CHE	BSc, 3 Years	FtF	6 Design Studios + Non-electives & Electives	Accredited by the State Sect. for Edu, Rsrch&Innov
The Bartlett School of Arch.	UK	BSc, 3 Years	FtF	Design Projects (Units: Field work&trips) + Non-electives	Accredited by RIBA

When the table is examined, it can be seen that the studio courses, which are the foundation of architectural education, are not frequently given online, but in some cases, it is possible. For example, theoretical courses are generally offered online in hybrid learning, but studio courses are offered FtF.

As a consequence of the development of technology, media tools have started to be integrated into education. In architectural education, this integration manifests itself as 3D Models and BIM applications. Integration of digital media is critical to design and architectural education. Technology has radically changed the way lecturers can exchange information with students. With the ever-increasing need to communicate globally, distance is no longer a barrier to education. Many architecture faculties worldwide have offered their courses online at a cost or free of charge (see Figure 3). However, online courses, which are offered as a backup for FtF education, are not considered sufficient to obtain a Bachelor's degree in architecture.

Figure 3

Examples of online courses in MIT

Note. Adapted from MIT, n.d.

Although alternative media tools have been integrated into education, the framework of studio instruction has essentially remained unchanged. The contradiction between distance learning and architectural education in distance learning can be asynchronous; however, architectural education needs FtF communication (Sakarya, 2019).

During the Pandemic: Emergency Remote Teaching

As a consequence of the declaration of Covid-19 as a pandemic, educational institutions had switched the education type rapidly and on the spur of the moment. Normal classes were shifted into e-classes overnight, and educators had shifted their pedagogical approach to adapt to the changing situations (Dhawan, 2020). Thus, it would not be accurate to define this system as 'distance learning'. Instead, Hodges et al. (2020) define this process as 'an adaptation to existing conditions'. From this point of view, this system will be addressed as; 'Emergency Remote Teaching' in the study.

In emergency remote teaching, universities rapidly created virtual classes and continued the education within the body of their existing distance learning platforms (see Figure 4). Furthermore, courses were recorded, and students were able to access the recordings later. Some faculties provided their staff with technological equipment in this extraordinary period. Moreover, some universities used informal platforms instead of or in addition to their existing distance learning platforms (Dunton, 2020).

Figure 4
Architectural Design 3, Yildiz Technical University (Sungur Archive)

Emergency remote teaching enabled criticism of the traditional design studios, which is thought unlikely to be held online within the master-apprentice model that had been used for generations (Archinect, 2020). This crisis

forced the institutions, which were earlier reluctant to change, to accept modern technology. Doing so provided an opportunity to redefine and interpret the learning and teaching experiences of architecture departments.

The design juries were held online, with guest jury members, during the semester and at the end of the semester, the same as it was before (see Figure 5).

Figure 5

Design Jury of Architectural Design 3, Yildiz Technical University

Note. Sungur Archive.

There are four categories of competencies necessary for dealing with e-learning situations: technical, managerial, pedagogical, and academic (Vladescu, 2016). Moreover, online education was challenging for faculty staff in terms of time management because courses and juries took longer than FtF education. For example, the faculty staff of Yale University stated that they spent more time and energy maintaining student relationships, managing and teaching (Archinect, 2020). The University of Pennsylvania's Stuart Weitzman School of Design mentioned that they became efficient in education because the first part of the semester was FtF and the system was hybrid before the emergency remote teaching (Hilburg, 2020).

After completing the spring semester of 2020, architecture departments started to discuss which model of education would be offered for the next semester. While some faculties have announced their decisions for the fall semester of 2020, some have not decided about the mode of education yet. The possibility of a new wave of the pandemic in the autumn has forced universities to change their initial planning. These decisions have been actively responding to the ongoing developments related to this outbreak. The education plans for the fall semester of 2020 of some universities as of 8 July 2020 are given below (see Table 2).

Table 2

Fall semester education plans of some universities as of 8 July 2020

Name of the University	FtF	Hybrid	Fully Online	Notes
University of Cambridge		X		In any case, all lectures will be recorded and made available online
The AA			X	
Cornell University		X		
MIT			X	Some small group FtF
University of Bologna (As of 26 May 2020)		X		Synchronous or asynchronous, limited number of FtF
University of Salzburg (As of 29 June 2020)	X			Planning normal, Considering hybrid
University of Jaen (As of 29 June 2020)		X		
Hochschule Kaiser-slautern (As of June 24 2020)		X		Most courses will be online, some lessons and some exams could be FtF
Technical University of Wien (As of 6 July 2020)	X			Depending on the evolution of the situation
University of Turin			X	Incoming students will not be allowed to attend FtF activities
Complutense University of Madrid (As of 7 July 2020)	X			Depends on the evolution of the situation
Technical University of Madrid (As of 2 July 2020)		X		Hybrid Learning
University of Galati (As of 17 June 2020)				Have not decided yet, depending on the evolution of the situation
Carlos III University of Madrid (As of 8 July 2020)		X		- Large/aggregate session: Theoretical content. Synchronous online teaching. - Small group session: Practical content. Face-to-face teaching in the classroom. - Laboratories: Face-to-face or online synchronous teaching
University of Granada (As of 1 July 2020)		X		
University of Athens (As of 7 June 2020)			X	Depending on the evolution of the situation
University of Wroclaw (As of 8 July 2020)		X		All lectures will be online, seminars and small group sessions will be FtF

International Exchange Programs

The fact that the current process is a global epidemic forces the universities to make decisions about the education plans and the international student exchange programs. In the study, it was examined that the documents of Erasmus exchange programs of some European universities. Many universities (e.g., University of Bologna, University of Jaen, University of Wien, University

of Salzburg) are allowing incoming students to postpone their education to the next semester, while other universities are not accepting exchange students for the 2020 Fall semester (A. Zemann, personal communication, 3 July 2020; F. Valente, personal communication, 26 May 2020; M. Wonneberger, personal communication, 25 June 2020; University of Jaen, personal communication, 26 June 2020). The University of Turin has declared that they will not accept exchange students in FtF courses (A. T. Bernini, personal communication, 2 July 2020). The University of Pennsylvania has stated that they insist on the FtF model, and they can re-arrange the academic calendar according to the most recent conditions of the pandemic.

Online Architectural Education with a Focus on Quality

Emergency Remote Teaching, which was started unplanned, took longer than anticipated. As a result, a considerable amount of first-year students who began higher education in 2020 do not have an on-campus experience, and it remains uncertain when FtF education will start.

The quality of teaching and learning is also determining the quality of results. A poor learning design will result in a poor learning experience for both the students and the instructor. SWOC analyses of emergency remote teaching can be a road map to improve the quality of online education.

Figure 6

SWOC analyses of emergency remote teaching

Strengths - Location flexibility - Recorded courses	**Weaknesses** - Technical issues - Internet infrastructure - Unavailability of proper digital tools
Opportunities - Time flexibility - Technological development of modes of education	**Challenges** - Quality of education - Technological inequality - Time management

Pedagogically, before the pandemic, lecture materials or design project requirements are explained by the lecturer in front of the class, followed by interaction by giving the student feedback and, generally, there is a task at the end. However, during this online education, some routines of learning interactions changed (Allo & Deli, 2020).

During the pandemic, one of the main concerns was the efficient provision of the interactive education environment based on the master-apprentice

system established in the physical studio environment in the new distance education-teaching model (Ceylan et al., 2020).

According to Chapnick's Criteria for E-Learning Readiness, seven important factors ensure the quality of e-learning in higher educational institutions (Elumalai et al., 2020).

- Administrative support
- Course content and design
- Course design
- Social support (pedagogical approach)
- Technical support
- Instructor characteristics
- Learner characteristic

Course design is one of the major factors affecting the quality of online learning. There are many approaches to instructional/course design. The Backward Course Design Model, developed by Grant Wiggins and Jay McTighe in 2012, suggests that instruction should be developed first with the end goal in mind. Planning and development start with the course outcomes, and the curriculum is derived from what is needed to achieve those results (see Figure 6).

Figure 7
Backward Course Design Model

This approach can be used for Emergency Remote Teaching. For developing online courses for future terms, this model provides a framework for effective course design (O'Kefee et al., 2020).

Instructors should attempt to expand their students' horizons by explaining what is meant by online learning in a design studio environment at the beginning of the year. Tutors should also explain how the courses will be evaluated and establish the requirements and responsibilities expected from the students (Alnusairat et al., 2020).

As mentioned, student-student interaction is necessary for the quality of design education. Instructors should allow their students to critique other students' projects and see their works throughout the year. Some digital platforms (e.g., Miro, Mural) offer online visual collaboration for teamwork and enable working synchronously. This can be helpful for students to see the progress of their own and their friends over the course of the semester (see Figure 7).

Figure 8

Basic Design board in Miro

Note. Unver archive.

The absence of informal discussions and the spontaneity of exchanging ideas could be the reason for the diminished efficacy of the studio environment. Digital tools allow studio collaborations between institutions with participation from multiple locations by reducing distance barriers (Jafri & Varma, 2020).

Experiences and Opinions: A Case Study on Online Education During Covid-19

Covid-19 suddenly changed the course of architectural education, which is design-based with applied courses. To maintain the quality of architectural education, researching ongoing implementation, determining the experiences, opinions and approaches of students and academic staff, and defining the positive and negative aspects of the process are important. In this study, how faculty staff and students were affected by this unplanned shift has been investigated to identify the key point of future research about the new orientations of architectural education.

Within the scope of the study, the Architectural Departments of two universities in Istanbul (Yildiz Technical University and Kultur University) are chosen for the case study, one being a public university and the other a private one. The students and academic staff were asked for their experiences and opinions about the process and methods of distance learning. Between March 2020 and July 2020, two questionnaire forms were developed to be completed by 190 architecture students and 50 faculty staff of the mentioned universities as the data collection tool.

The questionnaire form for students consisted of three parts and 22 questions; the first part was demographic and accommodational questions, the second part was opinions and experiences, and the last part was open-ended questions about emergency remote teaching. The questionnaire form for academic staff consisted of three parts and 21 questions; the first part was demographic questions, the second part opinions and experiences, and the last part open-ended questions about emergency remote teaching.

Responses to the second part were made on a five-point Likert-type scale ranging from 1 = 'Strongly Disagree' to 5 = 'Strongly Agree'. SPSS (Statistical Package for Social Sciences) program was used to analyse the data collected via the questionnaire.

Findings

This study was conducted to examine; adaptation to online learning, the technical infrastructure of existing distance learning platforms of mentioned universities, self-expressions skills of the students', effects of the accommodation status to focusing and learning. There is a meaningful relationship between accommodation status and focusing problems of the students'. In addition to this, there also is a significant relationship between the sense of being a student and online learning. However, there is no meaningful relationship between online learning and self-improvement in presentations skills.

In the questionnaire, opinions and experiences of the students about emergency remote teaching were asked. According to the questionnaire, 40.5% ($n = 77$) of the students were living with their parents, 29.5% ($n = 56$) of students were living with a flatmate, 27.4% ($n = 52$) of students were living alone, and 2.6% ($n = 5$) of students were living with their relatives while studying at the university. During the quarantine, 90.3% ($n = 102$) of the students who were not living with their parents while studying moved back to their parents' house (see Figure 9).

Figure 9
Accommodation status before & during the pandemic

A total of 84.6% (n = 116) of the students who have an individual room in their houses had trouble focusing during emergency remote teaching (see Figure 10). Thus, before the pandemic, it can be said that it is important to have an individual room to focus, but there is no meaningful relationship between them during the pandemic.

Figure 10
Focusing problems whilst having a room of her/his own

When asked about the opinions and experiences about; adaptation to online learning, technological infrastructure, and the availability of distance learning platforms, the analysis of the students' answers is as follows (see Table 3).

Table 3

Assessments of students' responses to 'sense of learning' and 'focusing' questions

Questions	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
I had trouble adapting to distance learning.	4.2	12.6	15.8	21.1	46.3
The internet infrastructure where I live is adequate for online learning.	10.5	14.2	24.7	24.2	26.3
The quota of my internet is adequate for online learning.	23.7	13.2	22.1	17.4	23.7
The 'Distance Learning Platform' of my university is adequate for theoretical courses.	11.1	11.6	28.9	30.5	17.9
The 'Distance Learning Platform' of my university is adequate for applied courses.	53.7	17.4	16.8	6.8	5.3
It was easy to use the 3D Model Program instead of model making.	31.6	17.9	22.6	14.7	13.2
Not being in the studio environment is affecting my design capacity	12.1	5.8	12.1	15.3	54.7
I am having trouble focusing on courses.	2.6	3.7	7.9	18.9	66.8
The fact that family members are at home causes a lack of concentration.	11.6	9.5	11.1	22.6	45.3
I have difficulty expressing myself in virtual classes.	7.9	8.4	22.1	19.5	42.1
Distance learning reduced my school expenses.	3.2	3.2	7.9	17.9	67.9
Online design studio courses helped to improve my presentation skills.	30.5	22.1	24.7	11.1	11.6
It is challenging to access resources because of being absent on campus	8.9	13.2	19.5	22.1	36.3
Physically not being on campus makes me feel like I am not a college student.	6.3	6.8	10	16.8	60

When Table 3 is examined, it is seen that majority of the students had trouble adapting to distance learning (67.4%). Moreover, 60% of students strongly agree that 'physically not being on campus' makes them feel like they are not college students. Even if they continue living with friends, they also feel the same way (see Figure 11). In addition, a significant number of the students (61.8%, n: 118) stated that they have difficulty expressing themselves in virtual classes; 48.4% of the students stated that the existing distance learning platform of their universities are adequate for theoretical courses. However, the majority of the students (71.1%) found the same platforms to be inadequate for applied courses. Moreover, students had trouble focusing on courses (85.7%) and the fact that family members were at home caused a lack of concentration. A

significant number of the students had stated that distance learning reduced their school expenses.

Figure 11
'Sense of being a student'

When the universities' existing Distance Learning Platforms are evaluated, regardless of being at private or public universities, they are found to be almost adequate for theoretical courses. In contrast, the same platforms are stated as being inadequate for applied courses (see Figures 12 and 13).

Figure 12
Adequacy of DLP for theoretical courses

Figure 13
Adequacy of DLP for applied courses

As for the faculty staff, the advantages and the disadvantages of emergency remote teaching can be seen in Figures 14 and 15.

Figure 14
The advantages of emergency remote teaching, according to the lecturers

Figure 15
The disadvantages of emergency remote teaching, according to the lecturers

According to answers given to the survey, the faculty staff stated that they are eager to continue using the opportunities offered by online education, including thesis interviews, student interviews, online exams, and informal digital platforms, when they return to FtF education. In addition, academic staff answered in favour of supporting teaching online for theoretical courses (see Figure 16).

Figure 16

'Do you think faculty should be supported to do online teaching?

Discussion

Academical education around the world is facing a once-in-a-century event. Since an extraordinary situation is being experienced, the psychology of the students and the academic staff are also affected by the process, and various kinds of problems and challenges about concentration and adaptation have emerged. The questionnaire results showed that students had trouble focusing on courses in the case of returning to live with their parents, whether they have a sufficient room or a space of their own to study and work in or not. The presence of the family members seemed sufficient for the students to lack concentration. Some architecture departments continued teaching even on religious and national holidays in order to keep students concentrating. The Council of Higher Education referred to 'assessments of the students' as a recommendation to universities on 22 May 2020 and stated that 'homework, projects and attendance in courses should be evaluated in addition to online exams during the Covid-19' (Council of Higher Education, 2020).

As a result of the survey, the faculty staff stated that theoretical courses could be given online when education returns to FtF teaching. During the emergency remote teaching, faculty members realised that even if the system were not to continue fully online, all courses did not need to be offered via fully FtF teaching.

FtF education can be considered successful because it creates an educational environment that includes libraries, social activities, campus life, and related elements. It is seen that physically not being on campus makes the

students feel like they are not college students, which was related to the issue of 'the sense of belonging'. The fact is that the physical campus environment has a strict framework, and expectations from the students are clear.

However, bringing the students and the instructors together in a digital environment provides accessibility and equity for students with financial difficulties and some types of disabilities. In contrast, the existing distance learning platforms of the universities are not accessible and inclusive for different conditions of disabilities such as visually- and hearing-impaired students. Moreover, previous to the pandemic, architectural education was based on models and hard copies in school; emergency distance learning forced the people involved to think about the issues of carbon footprint and sustainability. The significant decrease in education expenses of the students reveals the necessity of the sustainability and inclusivity of the education from this point on. The factors, which affect the success of the emergency remote teaching are flexible course hours, ongoing daily routines and living with the family members during the quarantine.

Herein, to compare distance learning and emergency remote teaching instead of distance learning and FtF education emerges as a necessity to understand the differences between these methods (see Table 4).

Table 4

Comparison between Distance Learning and Emergency Remote Teaching

Distance Learning	Emergency Remote Teaching
Planning, arrangement and development processes of the distance learning based on 6-8 months before the courses.	Trying to adapt existing curriculum. Unplanned and rapid transition.
The students have sufficient technological equipment for courses he/she will take.	The students do not have equal technological equipment for distance learning.
Technical staff have enough time and experience for ideal solutions to the problems.	Technical staff solved problems sooner than anticipated.
Courses can take place in synchronous and asynchronous ways.	Courses had to take synchronously because of the compulsory attendance.
Courses are planned according to distance learning.	This is a situation that FtF courses are given online.
Time management is under the initiative of the instructor.	Instructors are having time management problems because of working in the home environment.

Emergency remote teaching broke down the prejudices about architectural education, which had been thought to be unlikely to be provided online. However, it can be seen in Table 4, the transition to distance learning in the shadow of Covid-19 brought some technological issues with it.

Conclusions

The threat of Covid-19 has presented some unique challenges for institutions of higher education; students, faculty and staff are needed to achieve extraordinary things regarding course delivery and learning. The concept of effective distance learning results from careful instructional design and planning and using a systematic model for design and constant development.

However, the rapid and unplanned transition to online learning has caused a lack of opportunities to benefit from, and students are to failing to achieve the existing potential of the academic environment. It has been revealed in this study that; the existing distance learning platforms of the universities are not adequate for architectural education during the extraordinary times that academia has experienced. This inadequacy is not necessarily a technical issue; rather, it is related to the unique essence of architectural education, as explained in the previous parts of this study. To obtain the competence of the distance learning platforms for architectural education, it is necessary to tailor-design the interfaces and the opportunities of these platforms according to the characteristics of this specific education itself. Moreover, universities constantly need to develop their distance learning platforms and ensure the continuity of the response to the emerging needs. Well-planned online learning is important for achieving institutional goals of both teaching and learning in higher education.

The suggestions to maintain and develop the quality of online architectural education, based on the reviews and the case study, are classified as administrative support, course content and design, technical support, pedagogical, and social support. These suggestions are given as follows:

Administrative support

- Providing access to the suitable/agreed on software(s) and applications (e.g., Zoom, Blackboard, etc.)
- Encouraging innovative course design, material and teaching tools without any bureaucratic setbacks.
- Using asynchronous learning solely for theoretical courses.
- Adopting national and international accreditation systems to online education and developing ways to ensure the quality of education

Course content and design

- Offering information in more than one format
- Providing data in different forms such as 3D maps, analysis files, etc.
- Integrating digital media, 3D Models and BIM applications

- Avoiding static slides or bulleted lists. Instead, stimulating different types of students; visual, auditory, reading/writing or kinaesthetic.
- Trying to expand students' horizons by explaining what is meant by online learning in a design studio environment.
- Explaining course evaluations and establishing the requirements and responsibilities expected from the students.
- Providing that all of the class is present on time
- Agreeing on the terms on the use of webcam and mic

Technical support

- Providing access to sufficient wireless connection and speed
- Providing access to suitable hardware for the lecturers (e.g., pen-based tablet)
- Making recorded courses accessible offline
- Providing two screens for the lecturers;

Pedagogical and social support

- Encouraging informal conversations among students outside the class hours via group chat
- Using some digital platforms to provide online collaboration between students (e.g., Miro, Mural, etc.)
- Giving the students more than one way to interact with the lecturer and each other and letting the students make choices
- Looking for multiple ways to motivate students

In the post-pandemic period, if institutions can analyse their weaknesses and strengths, they will be able to respond better to the next threats or, even better, they will be able to use this crisis as an opportunity to transform their method of education and offer a more accessible, cost-effective and sustainable instructional environment. This unplanned and urgent shift has shown us that we can embrace online teaching methods as an alternative that is neither worse nor better than FtF teaching.

This crisis also can be used by the faculties to reach beyond their borders.

The pandemic showed that policymakers should also design an Emergency Education Plan similar to the Disaster and Emergency Plan. In this period, the recommendations of the Council of Higher Education to universities about disabled students remained unfulfilled. This experience indicated that the rules and standards for accessibility and equity of disabled students in distance learning should be more neat and well-defined. Governments and institutions

have to focus on the design of flexible, inclusive and student-centred educational environments to ensure that all students have access to and benefit from course materials, activities and assignments.

Apart from these evaluations, an important fact to consider is that the existing physical spaces of most architecture faculties are not designed with the concept of 'education with social distancing' in mind. Therefore, the imagination of an architectural education, which is non-spatial and in interaction with different countries, is necessary. Future architects and educators will need to adapt themselves to the new normal and find a way of developing different ways of thinking in this period where the information is constantly changing. The main goal should be increasing the quality of interaction regardless of being online or FtF teaching, without losing the master-apprentice relationship established in traditional architectural education.

References

Ahmad, L., Sosa, M., & Musfy, K. (2020). Interior design teaching methodology during the global Covid-19 pandemic. *Interiority*, *3*(2), 163–184.

Allo, G., & Deli, M. (2020). Is the online learning good in the midst of Covid-19 pandemic? The case of EFL learners. *Jurnal Sinestesia*, *10*(1), 1–10.

Alnusairat, S., Al Maani, D., & Al-Jokhadar, A. (2020). Architecture students' satisfaction with and perceptions of online design studios during Covid-19 lockdown: the case of Jordan universities. *Archnet-IJAR: International Journal of Architectural Research*, *15*(1), 219–236.

Archinect. (2020). *Architecture deans on how covid-19 will impact architecture education*. https://archinect.com/features/article/150195369/architecture-deans-on-how-covid-19-will-impact-architecture-education.

Bender, D. M., & Vredevoogd, J. D. (2006). Using online education technologies to support studio instruction. *Education Technology & Society*, *9*(4), 114–122.

Bitzer, D. L. (1986). The PLATO project at the University of Illinois. *Engineering Education*, *77*(3), 175–80.

Celik, D. (2017). Assessment of the practices of distance education centers in universities of Turkey in terms of adult education (Doctoral dissertation, University of Ankara). https://tez.yok.gov.tr/UlusalTezMerkezi/giris.jsp

Ceylan, S., Sahin, P., Secmen, S., Somer, M. E., & Suher, K. H. (2020) An evaluation of online architectural design studios during Covid-19 outbreak. *Archnet-IJAR: International Journal of Architectural Research*, *15*(1), 203–218.

Council of Higher Education. (2020, May 7). *Council of higher education takes action towards the troubles of disabled students in distance learning*. https://www.yok.gov.tr/Sayfalar/Haberler/2020/engelli-ogrenciler-icin-uzaktan-egitim.aspx

Council of Higher Education. (2020, May 27) *Council of higher education announced the basic principles of the exams to be held in digital environment*. https://www.yok.gov.tr/Sayfalar/Haberler/2020/ universitelerde-dijital-sinavlarin-temel-ilkeleri.aspx

Dhawan, S. (2020). Online learning: A panacea in the time of Covid-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5–22.

Dunton, J. (2020). How Covid-19 is changing the face of architecture schools. https://www.bdonline.co.uk/news/how-covid-19-is-changing-the-face-of-architecture-schools/5105159.article

Elumalai, K. V., Sankar, J. P., Chandrahasan, R, K., John, J. A., Menon, N., Alqahtani, M. S. N., & Abumelha, M. A. (2020). Factors affecting the quality of e-learning during the Covid-19 pandemic from the perspective of higher education students. *Journal of Information Technology Education: Research*, *19*(1), 731–753.

Ghonim, M., & Eweda, N. (2018). Investigating elective course in architectural education. *Frontiers of Architectural Research*, *2018*(7), 235–256.

Harting, K., & Erthal, M. (2005). History of distance learning. *Information Technology, Learning and Performance Journal*, *23*(1), 35–44.

Hilburg, J. (2020). The Coronavirus pandemic is forcing architectural schools to rethink remote learning. https://www.archpaper.com/2020/06/coronavirus-pandemic-architecture-schools-rethink-remote-learning/

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

Jafri, M. S., & Varma, A. (2020). Covid-19 responsive teaching of undergraduate architecture programs in India: learnings for post-pandemic education. *Archnet-IJAR: International Journal of Architectural Research*, *15*(1), 189–202.

Kaya, Z. (2002). *Uzaktan eğitim* [Distance learning]. Pagem A.

Khalid, S., & Steino, M. (2017). The hybrid studio – introducing Google+ as a blend learning platform for architectural design studio teaching, *Journal of Problem Based Learning in Higher Education*, *5*(1), 22–46.

MIT Open Courseware. (n.d). *Architecture*. https://ocw.mit.edu/courses/architecture/

Morin, A. (2014). *What is universal design for learning (UDL)? Understood.* https://www.understood.org/en/learning-thinking-differences/treatments-approaches/educational-strategies/universal-design-for-learning-what-it-is-and-how-it-works

O'Keefe, L., Rafferty, J., Gunder, A., & Vignare, K. (2020). *Delivering high-quality instruction online in response to Covid-19: faculty playbook*. Every Learner Everywhere. https://www.everylearnereverywhere.org/resources/delivering-high-quality-instruction-online-in-response-to-covid-19/

Sagun, A., Demirkan, H., & Goktepe, M. (2008). A framework for the design studio in web-based education. *Journal of Art & Design Education*, *20*(3), 332–342.

Sakarya, K. (2019). Suggestions of distance education models for interior design education. *Journal of*

Çukurova *University Institute of Social Sciences*, *28*(2), 388–401.

Tekeli, I. (2014). *Architectural Education*. http://www.mimarlikdergisi.com/index.cfm?sayfa=mimarlik&DergiSayi=392& RecID=3442

Vladescu, I. (2016). Digital competences for teachers. In O. Titrek, I. Mikelsone, L. Pavitola, & G. S. Gultekin (Eds.), *International conference on lifelong education and leadership for all* (pp. 716–721). Sakarya University Faculty of Education.

Yildiz Technical University. (2020). *Internship*. http://www.mim.yildiz.edu.tr/mim/26/Staj/162

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