ONLINE JURY EXPERIENCES IN INDUSTRIAL DESIGN EDUCATION AND DESIGN DIRECTIONS FOR ONLINE PLATFORMS

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ABSTRACT

ONLINE JURY EXPERIENCES IN INDUSTRIAL DESIGN EDUCATION AND DESIGN DIRECTIONS FOR ONLINE PLATFORMS

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Juries have a significant place in industrial design education as a means of learning and evaluation. Juries have traditionally been conducted mainly in a similar flow and face-to-face for decades. In recent years, online juries have widely experienced the effects of digitalization and the Covid-19 pandemic. This thesis research aims to explore and define the advantages of online juries as well as the needs of students and jurors regarding the limitations of online juries in industrial design education. In the study, online juries were observed, and semi-structured interviews were conducted with both students and jury members in the Department of Industrial Design at METU. The study results determined the convenience and difficulties experienced by students and jury members in online juries. Accordingly, potential design directions are presented for online platforms that will support a better online jury experience by considering traditional jury dynamics.

Keywords: Industrial Design Education, Online Jury Experiences, Online Platforms

ÖZ

ENDÜSTRİYEL TASARIM EĞİTİMİNDE ÇEVRİMİÇİ JÜRİ DENEYİMLERİ VE ÇEVRİMİÇİ PLATFORMLAR İÇİN TASARIM YÖNERGELERİ

Yavuz, Etkin Cemre
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Endüstriyel tasarım eğitiminde jüriler, öğrenme ve değerlendirme ortamı olarak önemli bir yere sahiptir. Jüriler, uzun yıllardır çoğunlukla geleneksel olarak benzer akışta ve yüz yüze yürütülmektedir. Son yıllarda dijitalleşmenin ve Covid-19 pandemisinin etkileriyle çevrimiçi jüriler yaygın bir şekilde deneyimlendi. Bu tez araştırması, endüstriyel tasarım eğitiminde çevrimiçi jürilerin avantajlarını ve aynı zamanda sınırlamalarına ilişkin öğrencilerin ve jüri üyelerinin ihtiyaçlarını araştırmayı ve tanımlamayı amaçlamaktadır. Çalışmada, ODTÜ Endüstriyel Tasarım bölümü örneğinde çevrimiçi jüriler gözlemlenmiş ve hem öğrenci hem de jüri üyeleriyle yarı yapılandırılmış görüşmeler yürütülmüştür. Çalışmanın sonuçlarında, öğrenci ve jüri üyelerinin çevrimiçi jürilerde yaşadığı kolaylık ve zorluklar tespit edilmiştir. Bu doğrultuda, çevrimiçi platformlar için, geleneksel jüri dinamiklerini göz önünde bulundurarak daha iyi bir çevrimiçi jüri deneyimini destekleyecek tasarım yönergeleri sunulmuştur.

Anahtar Kelimeler: Endüstriyel Tasarım Eğitimi, Çevrimiçi Jüri Deneyimi, Çevrimiçi Platformlar

To mom & dad

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CHAPTER 1

INTRODUCTION

The foundation of design education dates back to the 17th century (Zeng, 2017), and its involvement in universities goes back to the 20th century (Lee, 2006). The history of design education, a unique form of education in which students present the design solution at the end of a process with studio-based learning Ochsner (2000), can be followed from the literature of other design fields. Industrial design can be counted among them. Design fields have many standard processes and dynamics, but each has different requirements and achievements. Industrial design and other design fields education take place in the studio, a unique environment (Hacıhasanoğlu, 2019). In the design studio, students experience a wide range of real-world tasks and project processes that encourage collaboration and teamwork based on a specific briefing (Lee, 2006). The project process usually ends with the jury session, which consists of the student's presentation and the academic jury's evaluation (Bender & Vredevoogd, 2006). The jury system is a feedback and evaluation tool (Smith, 2011) that can be described as a traditional ritual for industrial design and other design fields (Salama & El-Attar, 2010). In the first appearance of juries, students' projects were evaluated only visually, but today most juries are required to present students' work both verbally and visually (Anthony, 1987). Students explain the project processes, final design, and how the inputs in the process affect the project idea to the juries with the project deliverables (Yorgancoglu et al., 2021). In the traditional jury setup, posters of the project are hung on the wall or the board; usually, the physical model and the screen to display the video are set up next to the poster (Musa, 2020). While the presenting student is standing in front of the project deliverables, there is a setting with the jury members in the front row and other students in the

back row (Webster, 2006). This seating arrangement, which supports the idea of students being evaluated and jurors being evaluators, may cause the behavior of the juries to be authoritarian and aggressive (McDonald ve Michela, 2019). The jury experience, traditionally in a particular seating arrangement and flows for decades, has been done online in recent years. An infectious disease that emerged in China in 2019 led to the Covid-19 pandemic (World Health Organization, 2020). Since March 2020, all education programs worldwide have been online without foresight or planning (Spitz et al., 2020). In fact, there has been a noticeable increase in online degree programs since the 1990s (Wallace, 2003), and online education is considered to have great potential to support education at all levels (Siemens et al., 2015). Jonasson also mentioned in his 1997 article that online education, which has two forms, synchronous and asynchronous (Fleischmann, 2020), will be important in the future. Although the online education literature is rich in research, the rapid transition due to the unexpected pandemic caused educators to be unprepared. Industrial design education is a collaborative and interactive process by nature (Fleischmann, 2020), and the online design jury has changed the traditional experience. In fact, in a study conducted during the pandemic period, Ceylan et al. (2020) stated that there is no significant difference between the traditional jury and the online jury regarding flow and arrangement. It can be said that the traditional jury experience was tried to be simulated online. The tools and platforms used in the online learning and teaching journey play a significant role, and choosing the right tool is critical for successful interaction (Abramenka, 2015). Online industrial design juries, in which the traditional flow is tried to be continued with the support of tools and platforms, may have encountered new facilitating and restrictive experiences. Raising from these foundations, this study focuses on online industrial design jury experiences. Regarding that, the thesis aims to better understand the advantages and limitations of online juries and the needs of students and jurors, along with suggesting potential design directions for online platforms.

1.1 Aim and Goal of the Research

The literature on industrial design education highlights the significance of juries as assessment, learning, and communication environments where design projects come to finalization. While juries have been held in the physical environment and face to face for decades, they have been recently experienced online due to digitalization and the Covid-19 pandemic. Digital platforms and their features were used in the online juries with the motivation to preserve and maintain the traditional industrial design jury experience.

Therefore, this thesis study aims to:

- To provide knowledge about online industrial design jury experience
- To make recommendations on potential design directions for online platforms

This thesis will examine the experience of online juries of students and jurors in industrial design education. It will describe the conveniences, challenges, and requirements of platforms in the online jury experience. It would be helpful to provide information to educators and platform designers by examining the online jury experience in depth.

1.2 Research Questions

The two main questions and sub-questions of the thesis study are given below.

1. What are the experiences of students and jurors in online juries in industrial design education?
    - What are the advantages of online juries?
    - What are the needs of students and jurors concerning the limitations of online juries?
2. What are the potential design directions for online platforms with a specific focus on industrial design juries?

1.3 Significance of the Research

Juries have an undeniable importance in design education. Jury experiences have a critical place in the industrial design education literature as well as in the design education literature. The design jury can be considered a ceremony to celebrate the completion of a design project (Webster, 2006) and a learning opportunity for students (Anthony, 1987). Students have the chance to encounter and examine various perspectives on their work from multiple perspectives, through criticism from lecturers, visiting experts, and classmates (Süyük Makaklı & Özker, 2016). Salama & El-Attar (2010) define the jury system as a traditional educational ritual, and this experience has been maintained similarly for decades. In fact, in a study by Anthony (1987), the majority of people asked, including instructors, students, and people from the design field thought that the jury system could be improved. Besides having many valuable contributions, the traditional jury experience also has some obstacles. According to Musa (2020), one of the most critical obstacles in the jury was that the students had to stand in front of the project board, and the students could be seen as defenders and jury members as attackers. In the design jury literature, there is a rich research and article library that includes both the contributions and obstacles of juries to design education (Anthony, 1991; Anthony, 1987; Frederickson, 1990; Ilgaz, 2009; Musa, 2020; Peterson, 1979; Salama & El-Attar, 2010; Webster, 2006; Webster, 2007; Yorgancıoğlu et al., 2021).

Due to the Covid-19 pandemic, social isolation measures were taken in 2020 (Spitz et al., 2020), and education at higher education institutions worldwide took place online (Iranmanesh & Onur, 2021). Online education at the tertiary level is becoming increasingly popular (Wallace, 2003), which can be explained by the fact that there has been much research on online education over the decades. In these studies, it is discussed that online education has many supportive aspects besides its many restrictive aspects for students and educators (Bender & Vredevoogd, 2006; Broadfoot & Bennett, 2003; Chen & You, 2010; Fleischmann, 2019; Harasim, 2000; Hartnett, 2018; Jonasson, 1997; Siemens et al., 2015; Wallace, 2003). Online tools

and platforms, which have increased with technological developments, contribute to the functioning of education (Armstrong, 2011; Kuzma, 2011; Minhas et al., 2021; Steinø & Khalid, 2017). However, in the research conducted with design students and instructors, it was mentioned that the virtual environment is missing from the face-to-face connection (Iranmanesh & Onur, 2021). In the past years, with the online execution of industrial design education, the juries took place online. Simulating the jury experience online also depends on the effectiveness of tools and platforms (Fleischmann, 2020). Most tools and platforms used in online juries were not specialized for industrial design juries. Therefore, while some met the jury's needs in some respects, others failed.

When looking at online education and industrial design education literature, some common resources can be found. However, those who want to learn about the experiences of online industrial design juries, which traditionally held face-to-face, will encounter limited resources in the literature. In light of the literature review, it can be argued that this thesis study's focus and aims are directed at a significant gap in the literature (Figure 1.1.). This research concentrates on online industrial design jury experiences and their advantages, limitations, and needs. By examining this experience, both design directions for online platforms can be provided, and key points that will contribute to developing the traditional jury experience can be found.

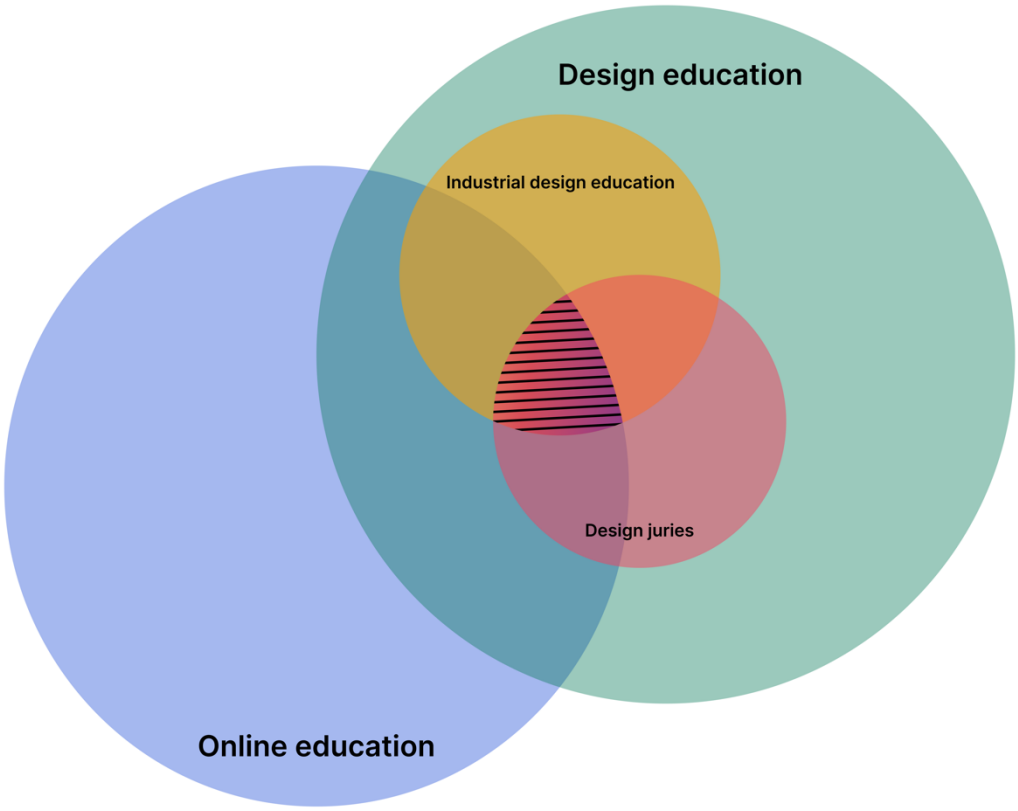


Figure 1.1 The scope of the research.

1.4 Thesis Structure

This thesis is organized into five chapters:

Chapter 1, *Introduction,* explains the research background of the study, its aim, goal, the research questions, and the significance of the study.

Chapter 2, *Literature Review,* presents a review of the literature related to the aim and goal of the research. This chapter initially explains the origins of design education and narrows it down to consider industrial design education along with its traditions. Then the review continues with the research on jury experience in design education and explains its dynamics. Lastly, it discusses online design education, including the Covid-19 pandemic effect on education. The chapter continues with

current research examples about online industrial design education and finalizes with a brief introduction of the tools and platforms used.

Chapter 3, *Methodology,* details the research methods adopted in this study. The chapter initially provides a detailed explanation of the research stages and the sampling, recruitment, and data collection in the field research. Then it touches upon the data analysis process in detail. The chapter finishes with the limitations of the study on the methodology.

Chapter 4, *Findings,* consists of detailed explanations of the findings from data analysis of the field research. The chapter describes the findings of the observations and interviews while providing in-depth knowledge about online industrial design jury experiences. Lastly, the chapter closes with a discussion of the field research findings, which consists of four main themes: Tools & Platforms, Deliverables, Communication & Interaction, and Covid-19.

Chapter 5, *Conclusion,* presents an overview of the study by connecting the research findings and the related literature for revisiting research questions. Chapter 5 presents an overview of the study, correlating the research findings and the related literature to revisit research questions. It provides information on the online jury experiences of both students and jurors and describes potential design directions of online platforms.

CHAPTER 2

LITERATURE REVIEW

In this chapter, the research questions will be examined through a review of the literature about design education, design juries, and online design education. It begins by identifying and reviewing published literature to look at the origins of design education and specialized to industrial design education. The second section of the chapter aims to discuss and clarify design juries and their dynamics. And the potential and restrictions of online education in the field of industrial design, specifically in the juries and considered Covid-19 effect, are discussed in the last section.

2.1 Origins of Design Education

The master and apprentice paradigm, likely the oldest formal pedagogy in western civilization, serves as the foundation for design education (Friedman, 2000). In design education, the aspect of the master-apprentice relationship has a significant impact on the student's emotional and psychological growth. Unfortunately, this connection still relies on an antiquated hierarchical academic model from the eighteenth century in many design education schools (Crowther, 2013). The foundation of design education stands back to the 17th century when dialogical, practical, project-based learning methods were first formalized in art schools (Zeng, 2017). Then introduced to universities in the 20th, they have largely progressed unhindered and independently from the dominant educational tradition (Lee, 2006).

Looking beyond the 17th century before it was introduced to the universities, the German Bauhaus school, founded during the European Industrial Revolution in the

first half of the 18th century, provided the blueprint for global industrial design education (Zeng, 2017). As Zeng (2017) mentioned, it was accomplished in the era of the traditional industrial economy characterized by mechanical technology. "Art and Technology: A New Unity," Gropius' catchphrase for the world exhibition held in Weimar in 1923, is one of the most well-known catchphrases associated with the Bauhaus (Findeli, 2001). This is the theoretical framework upon which the Bauhaus school of thought was built (Findeli, 2001). The Bauhaus school adopts this, an important source of inspiration for design education, and guides design education as follows: design education must prepare students for technological change.

When we move on to the 19th century, two main paradigms have been defined and are now considered outdated (Findeli, 2001). Applied art and applied science were the two main paradigms. According to research into the field's historical evolution, design theory has been embraced to explain the logic (or epistemology) of design thinking. Both are outdated today because they have their roots in the nineteenth century. The term "applied" describes the practical aspect of the artifacts; the artistic aspect is not included. The framework of applied science is the same: science now serves as the referent, or basic discipline, to be put into practice in place of art (Findeli, 2001).

As mentioned previously, design education has been born in different eras under the effects of different geological regions. Er, et al. (2003) touch upon explaining interactions between nations and the evolution of design in many countries under varying social, economic, and political circumstances will play an essential role in the international history of design. Approaching the present, design education in some peripheral countries, for instance, Turkey and Korea in the late 1950s and 1960s, seem to be a result of aid initiatives that were crucial to U.S. foreign policy during the Cold War, which aimed to contain the Soviet threat (Er et al., 2003).

What is Design Education?

According to the Atelier method, which is from the "Ecole Des Beaux Arts" model (1819-1914) which is the foundation for an educational approach that today forms the basis of design where the instruction in design provided by working professionals, followed by the jury's final assessment of the students' work (Broadfoot & Bennett, 2003), and also adapted by the influential Bauhaus School (1919-1932) (Fleischmann, 2020), design education is mainly experiential (Lee, 2006). Also, the Kolb learning cycle (Figure 2.1) agrees that building integrative knowledge through experience is essential for high-level thinking. (Laurillard, 2002).

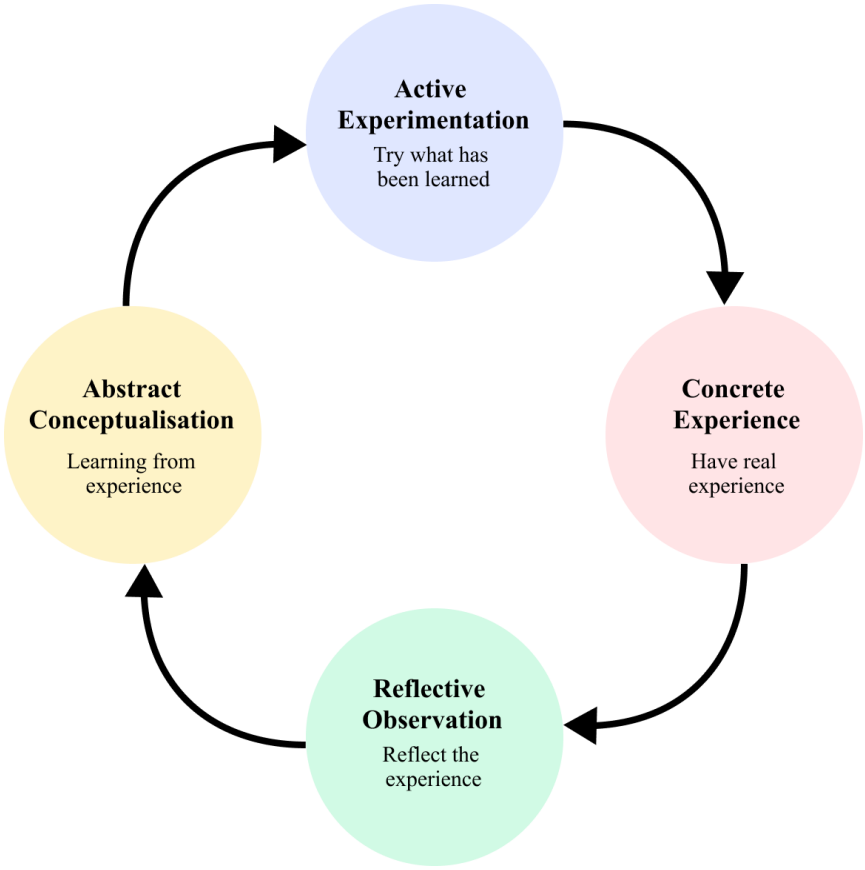


Figure 2.1. Kolb learning cycle adapted from Laurillard (2002).

According to Crowther (2013, p. 18), in experience-based learning, the term "studio" is defined as the manner of interaction. And it was previously widespread and

obviously derived from the Bauhaus workshop model, which has become increasingly elusive. Project- and problem-based learning have been added to activity-based learning, and there are now countless variants in teaching strategies, assessment techniques, and educational philosophies (Lee, 2006). This supports the importance of studio-based learning nowadays, derived from the experience-based learning technique. Ochsner (2000) points out that in studio-based learning, each student is expected to build a unique process of inquiry that results in a design solution.

Education in design needs to educate students about change more than ever. To achieve this, it must transform from a teaching-centered atmosphere to a learning-centered one that can be accepted as an experience-based learning method that encourages students to take risks and realize their full potential both within and outside academic programs. So, instead of just imparting knowledge, the work of a design educator now includes inspiring and facilitating orientation for a more meaningful practice (Icograda Manifesto, 2000).

One should know that the aforementioned is not limited to the field of industrial design only. The historical development of design can be found in the literature of other design fields, such as architecture and fine arts. This thesis study focuses on online industrial design juries. The literature was examined in terms of design education and after that, it is specialized to industrial design education in order to continue in a more focused way.

2.1.1 Industrial Design Education

Accepted as the birth of design education a century ago, The German Bauhaus School was founded to promote contemporary industrial design (ID) in academic settings (Huang et al., 2020). Later, numerous colleges and universities in Europe and the USA adopted their ideas regarding design education, which aided in developing a relatively advanced education system (Huang et al., 2020). On the other

hand, Er et al. (2003, p. 17) defined the birth of the discipline and practice of industrial design after World War II, which moved to *peripheral* nations. The 1950s and 1960s saw the introduction of industrial design into regional industrial, cultural, and political contexts in many peripheral nations. This process was inextricably linked to the ideas of *industrialization* and *modernization* (Er et al., 2003).

In addition to changing lifestyles brought on by technological advancement, ID education must also take into account changes in the industry and social structures (Huang et al., 2020). It can be said that the curriculum planned in industrial design education should be dynamic in keeping up with these global changes and should be open to updates.

2.1.1.1 Industrial Design Education in Turkey

In terms of implementing many models, education in general and design education in Turkey both reflect the whole diversity of the time of westernization and all of its features and experiences. Because Turkey has these experiences, it has an advantage over all western nations in developing models (Özer, 2004).

Examining the interconnections between the center and the periphery is essential for a complete understanding of global design history, according to the history of industrial design education in Turkey. Nevertheless, it greatly influenced how the industrial design evolved in the periphery (Er et al., 2003).

METU has released the one of the first formal declaration from a university industrial design department in Turkey. The recruitment of American industrial designer David K. Munro (IDSA of New York) by AID to carry out the formation of the industrial design department in 1969 marked the commencement of industrial design education at METU both formally and practically (Er et al., 2003). In the 1970s, the department of architecture offered an elective course in industrial design and in May 1979, the METU Department of Industrial Design was founded with a BID program (Er et al., 2003).

2.1.2 Design Studio

As mentioned before, industrial design education and even in general design education, is project-based (Lee, 2006). Also, Fleischmann (2020), in her literature review, approves students who wish to go into the design field participating in project-based learning very frequently as part of their education. Within every project iteration, the cycle of evaluating knowledge inside experience and experience within understanding is repeated many times, with the participation of classmates, clients, instructors, and shared thoughts on the endeavor (Lee, 2006).

Given that many design education curricula included design studios wherein design education occurs in a unique educational setting, students and instructors engaged in the studios in a unique manner (Hacıhasanoğlu, 2019). Hacıhasanoğlu (2019) proves that one of the fundamental subjects in design education is the studio environment.

The term "studio" is used amorphously in the design industry to refer to both a physical location (where learning and teaching actions occur) and a method of participation (as a pedagogical strategy) (Crowther, 2013). Although design studio is sometimes referred to as the core of the architectural practice, remarkably little research has been done on the dynamics of teacher-student interaction in studio places (Ochsner, 2000). In addition to the previous, Crowther (2013) continues as; the benefits, opportunities, and drawbacks of the studio are not exclusive to the field of architecture. In design schools, the studio is employed as the primary setting for teaching and learning. Design studios are a unique type of learning environment that is included in many design school curricula. Thus, students and teachers have interacted with studios in extremely unusual ways (Hacihasanoglu, 2019).

The industrial design courses is taught in a single classroom located in the faculty building that is only accessible by staff and students and is known as the "studio" (Lee, 2006). He additionally outlined its aims as follows: creating a professional environment for learning that replicates design and management methods used in industry, giving a wide range of real-world project experiences inside genuine,

unrestricted dilemma scenarios, and fostering cooperation and teamwork behaviors in a secure, team-based classroom setting.

Design studio sessions often convene approximately 9 to sixteen hours per week. Therefore, design studio instruction is set up so that experts interact with students (Attoe & Mugerauer, 1991). Attoe & Mugerauer (1991) also explain the logic behind the long studio sessions: more time is spent teaching the design process to students than any other subject. In design studio, usually, a problem is presented, and information about the problem is made available. The learner then starts the occasionally protracted and frequently frustrating process of looking for an answer. Fleischmann (2020) agrees with the technique in which a design challenge that professional designers would face is assigned to the class. Throughout this process of problem-solving and synthesizing, the studio instructor converses with the student regularly and in-depth (Attoe & Mugerauer, 1991).

Learning and teaching about design are very participatory. The key components of design studio training are sharing ideas with peers and overlapping ideas (Fleischmann, 2020). In fact, this teaching method aims to establish a learning environment where students work on design projects. At the same time, instructors provide formative feedback in the form of informal individual reviews during weekly courses, according to Crowther (2013). Moreover, in this kind of instruction, the teacher-student connection is vital, as Ochsner (2000) mentions, and he supports his idea and says the ability of the teacher to provide *a shared play environment* in which these cooperative activities may occur is what ultimately determines the success of the studio processes, which Schön (1983) characterizes as telling, listening, showing, and imitation.

By quoting Stevens' work, Crowther (2013) validated his arguments, which numerous authors have endorsed in their publications. The design studio is frequently referred to as the location where knowledge and abilities from several areas are merged and applied. It is widely acknowledged as the most distinctive and significant of all the locations or activities in design degrees (Crowther, 2013).

In the design studio, each student is expected to solve the design problem that is the subject of the term project (Ochsner, 2000). Students present their designs more officially or pin their work-in-progress on the wall while developing a solution to get feedback from the instructor, peers, and, occasionally, design experts during critique sessions. Through the instructor's and classmates' criticisms, students get the chance to encounter diverse perspectives on their work and examine it from multiple perspectives. They exchange ideas with one another, engage actively, and develop critical thinking as a result (Süyük Makaklı & Özker, 2016). Studio instruction involves extensive one-on-one interaction in which the instructor examines the student's creative concepts (Attoe & Mugerauer, 1991). The semester of studio often concludes with a conference presentation of the design project, which is evaluated by an academic jury. As Ochsner (2000) supports with his example, design studio education stands apart from many other university programs of study because of these distinctive features.

In the design studio, which is among the important traditions of industrial design education, the importance of juries is noticeably great. This thesis research explores online design juries, which are traditionally conducted face-to-face and are a powerful interaction environment. The next section explains and discusses the juries in design education, along with a detailed literature review.

2.2 The Jury in Design Education

Although this thesis study focuses on design juries in industrial design education, there are not many specialized resources in this field; besides, most of the research on the jury is handled within the framework of architectural education. Therefore, the jury experiences mentioned in this section are not explicitly mentioned in the industrial design department but as design education juries in a broader context.

Before the Ecole Des Beaus-Arts started to launch the open-jury system, student projects were evaluated within closed-door meetings in the assessment process at the

beginning of the 19th century (Salama & El-Attar, 2010). The Ecole Des Beaux Arts classrooms, sometimes described as "ateliers," served as the foundation for a pedagogical approach that remains at the heart of design and architectural education today (Broadfoot & Bennett, 2003). They also introduced the architectural jury system as a traditional educational ritual as part of an evaluation procedure that developed into a tool for education and evaluation (Salama & El-Attar, 2010). One other research agrees with the idea that experts and students recognized that the current jury system had a significant history of its roots going back to the nineteenth-century École des Beaux-Arts, even though the beginnings of design juries are not accurately described in the literature (Anthony, 1991). As mentioned, the Ecole des Beaux-Arts held its design jury meetings behind closed doors. The students' design work was evaluated based on visual submissions; no spoken presentations were given (Anthony, 1987). On the contrary, she also stated that most juries or evaluations in today's architectural schools require students to exhibit their work orally and graphically.

In architecture especially and the visual arts generally, juries and jury critiques, whether it be self-criticism, peer evaluation, or expert mentoring, an essential component of the creating process (Scagnetti, 2017), therefore they have been a didactic reality of life since the beginnings of formal educational learning (Collins, 1966 as cited in, Peterson, 1979).

A standard method of evaluating architectural learning is the jury system which is the answer when we say what the jury is, according to Salama & El-Attar, (2010). In most architecture schools worldwide, the jury system has historically served as a platform and an evaluation mechanism for students' work (Alagbe et al., 2015). A critical component of evaluating and enhancing students' studio learning and understanding is jury critique, commonly referred to as crits and design reviews (Ilozor, 2006). Webster (2006) stated that every design effort in the school received constructive criticism from the design jury, which frequently included outside critics. As a result, she continued that, students participated in the design jury as a significant pedagogical event throughout their full-time architectural education. Additionally, a

setting for active learning through team or individualized dilemma work was also noted as being created by the architecture design studio environment (Alagbe et al., 2015). The fact that design juries are participatory and offer feedback while conversations take place gives them an advantage over exams and term papers (Ilgaz, 2009).

Finally, when we look at how the process goes through the juries, Yorgancoglu et al. (2021) exposed the time when students come to a stage to present their work most descriptively as the student describes the whole design process to the design jury, including how input from earlier phases of the process influenced the project. The project's current flaws and weaknesses are listed, along with recommendations for how they might be fixed in the upcoming stage and students learn about design information and how it may be used to inform their future design choices (Yorgancoglu et al., 2021).

2.2.1 Design Juries as an Assessment Method

In reality, critique in design jury serves purposes beyond assessment in design education (Scagnetti, 2017). It is not just an assessment; it has many roles and goals, as mentioned before. Design juries are discussed in terms of assessment in this section, as they are the key component of assessment.

According to the study by Musa (2020), one of the main goals of the design jury is evaluation and grading. The jury crit is the most popular feedback and evaluation utilized in architecture and other art and design programs (Smith, 2011). Moreover, in architecture education, jury criticism is the primary form of review and evaluation for design courses (Anthony, 1991). According to Ilgaz (2009), the students are designated to be evaluated, while the jurors are the assessors in the jury evaluation method. He adds that power is transferred from students to jurors through grading and the jurors' location concerning each other when the two sides communicate on a similar platform. In the paper by Yorgancıoglu (2021), although the result may not

always accurately reflect the quality of the design process, it is shown that participating students are occasionally perplexed as to whether the deliverable or the process of a design project is being assessed. While describing their experiences with design jurors as deeply demotivating and competitive, it is relatively uncommon for students to characterize the design juries as an opportunity for individual learning and the group celebration of student success (Webster, 2006).

The jury, which determines whether or not the students pass or fail, has the final say in their fate (Anthony, 1987). Furthermore, jury goals and evaluation standards differ among jurors and schools (Alagbe et al., 2015). Moreover, Smith's (2011) research showed that many participants expressed concern that they were unaware of or did not understand the assessment criteria. They recommended being informed of the marking scheme or standardized criteria to be used to guarantee that all instructors concentrated on the same topics. This notion hampered the learning process. Students who are anxious about their marks tend to conceal design defects, be fiercely protective of their work, be intolerant of viewpoints that are different from their own, and give less attention to the comments made by the jury (Anthony, 1991). Eventually, students miss out on many of the excellent learning opportunities the jury offers because they are aware that they are being graded (Musa, 2020).

Due to weariness, anxiety, and stress about their performance and grades, many students believe that they have not benefited much from jury remarks and claim that they cannot recall something about their peers' projects that were given before or after their own (Anthony, 1991). One behavior that could be a solution to Anthony's (1991) anxiety is mentioned in Smith's (2011) article. In short: his friends take notes during the students' presentations and give them in writing because he cannot remember them concisely.

Finally, there is no way to guarantee that the evaluation environment would be a healthy, beneficial, and successful experience for the students without offering adequate preparation or advice before criticism (Koch et al., 2002, as cited in Ilozor, 2006).

2.2.2 The Dynamics of Design Juries

The design jury can be thought of as a ceremony whose formal elements, constituency, spatiality, choreography, and dialogue come together to create the jury a memorable event for everyone to celebrate the completion of a design project (Webster, 2006). However, this ceremony does not always proceed as expected; things might go inversely, and juries could become inefficient or destructive (Frederickson, 1990). It is impossible to dispute the jury's assertion that it is one of the most significant ritual occasions in the lives of design students. In this section, some fundamental dynamics of the jury, which will cause it to be one of the unique environment, are mentioned (Anthony, 1987; Frederickson, 1990; Musa, 2020; Salama & El-Attar, 2010; Scagnetti, 2017; Smith, 2011; Webster, 2006a; Webster, 2006b).

2.2.2.1 Seating Arrangement

The design jury is set up in a fan-shaped arrangement in front of the project of the presenting student, with front rows reserved for members of the jury and the back rows for the students (Webster, 2006a). This seating arrangement may lead the jurors to see themselves as "gate-keepers" and, therefore, their behavior to be authoritative and dominant (McDonald & Michela, 2019, p. 4). As a result, the critics are granted the authority to "evaluate" the relevance of the atelier's work within the current architectural debate (Webster, 2007). According to Boyer and Mitgang (1996), such a setting promotes the idea that jurors are attackers and students are defenders. This action may bring out the worst in both jurors and students. It is not unexpected that the existing jury system is not as functional as teachers would prefer to believe (Salama & El-Attar, 2010). It is not surprising that tutors do not participate much as they often have their backs to the peer audience and sit facing the student being evaluated (Smith, 2011). According to Musa’s study (2020), one of the significant obstacles of the jury was that students had to stand in front of the panel and "defend"

their work in front of them. Additionally, some respondents admitted to feeling anxious in this circumstance, and observation revealed that a few students even began to shake before the jury. Boyer and Mitgang (1996) support the round-table arrangement. Students feel like equal participants in the evaluation process when they sit at a table with jurors, which encourages them to have a discourse based on respect for one another (Musa, 2020).

2.2.2.2 Presentation

Musa (2020) explained how a typical setup occurs in a presentation as presentation papers of a project in question are nailed to a wall or boards; occasionally, a model of the project, a screen streaming a video of this project, or both are set up next to the papers. Most students' comments show that growth and enhancement of verbal presenting abilities seemed to be the most significant aspect of their experience in the final juries (Salama & El-Attar, 2010). Accordingly, 71.72% of students think that using practical approaches significantly impacts their final grades regardless of the design principles and ideas. When required to present in front of an audience, many of the students questioned, especially the less talented or introverted ones, experienced nervousness and, in some cases, severe anguish (Webster, 2006a).

2.2.2.3 Time

As an example of time management in juries, Webster (2006a) mentions in her paper that every student gives a vocal presentation of their design project (5–10 minutes), showing their ideas with sketches and prototypes, and then there is a question-and-answer period (10–15 minutes) after each presentation. She clarifies, in this presentation, twenty students out of a possible 38 believe they have enough time to show their work. That time is often about ten minutes delivered in a study conducted by Salama & El-Attar, (2010). One to eight weeks of three-dimensional thought must be condensed into a 10 to twenty-minute presentation, a challenging assignment for

the student to complete (Frederickson, 1990). Furthermore, defending the same project in front of an audience of experienced and highly talented experts is much more complicated.

2.2.2.4 Students

Since we know and Ilozor (2006) mentioned, what transpires during jury sessions is a mutual commitment of the jurors and students. As stated before, students are mostly overly worried about misjudgment. When the time comes to plan the presentation, students want to be sure they know in advance the criteria of their evaluation and have enough time for the presentation. As Salama & El-Attar, (2010) suggested, giving students enough chances to express and defend their viewpoints and having simple and straightforward feedback can be the solution to the misjudgment that Ilozor (2006) mentioned. Anthony (1987) described the jury as students' exposure to new information and learning. She also mentioned that students should engage more actively, be more organized, braver, and have a good attitude, according to those who believe the system may be improved. They should also view the jury as a learning opportunity. Her observations showed that most architecture students exhibit protective and anxious behavior when listening to the jury's opinions, and this conduct was largely nonverbal. The most frequent student behaviors were trying to cross both arms and legs, looking away, and concealing the lips or chin. In addition, twiddling their hands, pounding their feet, walking, rubbing their torso in various places, and chewing their fingernails were also observed (Anthony, 1987).

2.2.2.5 Jurors

Both instructors and employees believe that the specifically created group of external critics, typically recruited from internal and external academics and working

professionals, represent the ideals of the external architectural world (Webster, 2006b).

Students value positive critique dramatically, yet it is not given to them frequently enough (Anthony, 1987). For this reason, students fear that some jurors may not have appreciated their commitment or recognize that they are evaluating work from students still in the learning process (Musa, 2020). Due to their subjectivity and code of conduct, jurors are believed to be the primary cause of issues with the jury system (Salama & El-Attar, 2010). Insufficient consistency in jury crits can take a number of various forms, like inconsistent comments from instructors, varying expectations, and contradicting one another at successive crits. This problem, accordingly, is central to how creative fields are evaluated (Smith, 2011). It is nonetheless evident that although specific efforts to educate the juror's design stage, their focus on students' work tends to lean more towards pointing out project flaws than successes (Ilozor, 2006). Peers said that the procedure is needlessly combative and that tutors do not respect their perspectives. They think an instructor's choices, attitude, and even emotions might impact how well their crit is received (Smith, 2011).

2.2.2.6 Feedback

Students often explain the concepts and details of their design proposal while presenting sketches and prototypes in front of a small panel of instructors and a crowd of their peers. After that, tutors give input on the design and offer recommendations for how it may be improved and addressed further (Smith, 2011). The juror's behaviors might be essentially judgmental and unlikely to inspire, encourage, or support the students' reflective process of learning (Webster, 2006b). The inequality among jurors and students is accentuated by "directive" input that instructs the student on what to do and/or "judgmental" feedback that evaluates the projects' quality based on the panel member's judgments (Scagnetti, 2017, p. 786).

To conclude, Ilozor's (2006) study's findings support that a more representative jury evaluation would provide more value and expand students' learning opportunities rather than overly highlighting their shortcomings. Also, the critique session should consist of an engaging dialogue between teachers and students, and feedback should be creative and productive rather than directive and critical (Scagnetti, 2017).

2.2.2.7 Dialogue & Wording

Substantial evidence is that a profoundly ingrained disciplinary culture promotes the ongoing use of critical jury verdicts (Anthony, 1991). According to the research by Smith (2011), participants firmly believe that criticism is demoralizing and frequently lacks constructive and encouraging comments. It is conceivable that students take what is meant to be helpful criticism the wrong way, especially if they feel as though they have to defend their work. When discussing negative jury experiences, participants' most prevalent complaint was the lack of an opportunity for jurors to remark and join in the conversation (Musa, 2020). Webster (2006a) also mentioned that numerous students admitted that after receiving critical verbal feedback on their presentations feel unable to discuss which led to a situation student start to question the aim of this process as they believe jurors are the only ones who says the last word therefore, they are always right. At such a phase, logic and openness have been replaced by animosity and hostility, and conversation is going out of date—one-way dialogue makes learning and listening extremely hard (Frederickson, 1990).

The data collected and presented by Webster (2006b, p. 295) demonstrates that the jury system should be viewed as a rich and complex ceremony that is not either fundamentally "good" or "bad" since it allows students to reflect thoughtfully on their individual and group perceptions of reality. The significant majority of individuals asked, including teachers, students, and working designers, think the jury system can be improved (Anthony, 1987). Can the conventional critique, which originates in the Ecole des Beaux-Arts of the nineteenth century (Anthony 1991, p.

9), change to identify its flaws and adopt modern pedagogical theory and best practices? The future of this vital evaluation component in architecture education must be considered if this topic is not answered (Smith, 2011).

2.3 Online Teaching and Learning in Higher Education

At both the graduate and undergraduate levels, online education has become a popular delivery technique (Wallace, 2003). There was a boom of correspondence for distance learning programs throughout the industrial revolution and the First World War. Many distance learning programs are now available worldwide thanks to the development of new media, first the radio and subsequently the television (Garrison, 1989 as cited in Jónasson, 1997). It was evident from the first introduction of a fully online course in 1981 (Harasim, 2000) that this new form of education had great potential to influence the structure and provision of education at all levels (Siemens et al., 2015).

Siemens et al. (2015) included articles about online learning in their review of the literature, which shifts the focus of education from instructor-centered (traditional classroom) education to student-centered (online learning). Also, they noted that success in an online course necessitates a certain degree of self-management, given that students can now select what, when, and with whom they learn. As Bernardo & Duarte (2020) cited in his article, Mayer (2019) mentioned that as learning gradually moves away from traditional formats (such as books and in-person lectures) and toward computer-based media, online education has attracted increased attention throughout time (e.g., podcasts, educational games). Else since the 1990s, there has been a sharp increase in online degree programs (Wallace, 2003). Jónasson projected that online education plays a significant role and probably would play an even larger part in the future in his paper from 1997. Furthermore, he agreed that attending a distance learning course where one may pick the time and location to get acclimated is simpler than attending a course at a set time and location. Then again, Means et al. (2013) argued that online learning is one of the fastest-growing technological

developments in education. Moreover, they said online learning is gaining in popularity because it promises to provide easier access to information and instruction at any time and from any place. In fact, according to the meta-analysis, students who learned online reported that they performed marginally better on average than those who received face-to-face education (Means et al., 2013).

There are two types of online education: synchronous and asynchronous, as Fleischmann (2020) derived. She continued by saying that a fully functional online learning environment is provided for the course content to be delivered. Then, she defined asynchronous learning as learning that does not include in-person connection with teachers and provides students the most freedom over when, where, and how quickly they study. Although provided entirely online, synchronous online design education contains a component in which students and instructors gather in a virtual setting at a predetermined time (e.g., to participate in a tutorial, a lecture, or to receive feedback) (Fleischmann, 2020). Therefore, online education is a remote learning type that uses the Internet and can take either an asynchronous or synchronous form. While the second enables participants to complete self-paced web-based assignments without live involvement, the first incorporates real-time teacher-student engagement (Bernardo & Duarte, 2020). Siemens et al. (2015) explain online learning similarly by saying it is a type of distant teaching where the learning process is mediated by technology, instruction is offered entirely online, and students and instructors are not obliged to be present at the exact moment and location. Alternatively, Harnett (2018) emphasizes that online learning is a type of distance education that uses technology resources to mediate communication between students and instructors who are geographically apart.

Chen and You (2002) noted the benefits of internet-based technologies, as referenced by Crowther (2013), including access to resources, new tools and approaches, simpler engagement and communication, and multimodal presentations and learning. Reffat (2007) identified the following advantages, which Crowther (2013) exemplified in his article. These advantages include improved exploratory learning, electronic communication, archiving and retrieval, synchronous and asynchronous

communication, extended collaboration times and locations, and the potential strengthening of social ties. According to their research findings, given the extensive university-level, multi-course, and student framework of the current study, Cavanaugh and Jacquemin (2015) claim that there is barely a difference in class-based student performance for courses in which both techniques are relevant.

Certain benefits such as flexibility, reduction of overcrowded classrooms, more enrollment, lower costs, and higher profits quickly emerged as an advantage of online learning as a teaching method (Clardy, 2009; Grandzol & Grandzol, 2006) cited in (Siemens et al., 2015). However, the widespread use of online learning has highlighted several disadvantages of teaching and learning in an online environment, including the cost of instructor training, feelings of isolation, and technological limitations (Siemens et al., 2015). In his article, which summarizes an evaluation of the program conducted from 1993-96, Jonasson (1997) introduces the findings with particular emphasis on Internet use. He explains that although most students have no experience with computer communication, they soon become familiar with this new method of communication. Even within just a few months, the Internet has become part of their learning environment, allowing communication with lecturers and each other. In addition, he continues, there is a strong need for interaction in most education, and almost all students state that they also need face-to-face classes and networking. Even though in many research we see online learning is believed to be (at least) equally successful as face-to-face learning there are inevitably some disadvantages of educating and learning through the Internet because students' need for communication and dialogue in face-to-face lessons is powerful (Jonasson, 1997),

As a disadvantage of distance education, the problem of the disappearance of education equality appears. The inequality of education in distance education related to electricity and internet infrastructure and technological opportunities due to the geographical area, such as the city, district, village, etc., becomes even more evident when the home conditions of the students are not the same (Şekerci et al. 2021). Because online learning is entirely reliant on technological tools and the Internet,

instructors and students with poor Internet connections risk not being able to access it (Adedoyin & Soykan, 2020). As a result, it can be said that providing the necessary equipment to support online learning is a significant challenge for educational institutions, faculty, and students.

In a study by Alnusairat et al. (2020), the efficacy of online collaboration, the amount of creativity in teamwork, student attitudes toward meeting with peers in person, and online collaboration technologies were all examined concerning peer learning and collaboration. On the whole questionnaire, students' satisfaction with this component is the lowest (17.1%) in a typical teaching approach, where a teacher is able to engage in one-on-one conversations with each student, enables the learner to ask prompt, direct questions, and receive prompt answers to their inquiries (Caston et al., 2015). Therefore, Caston et al. (2015) continue that students feel direct interaction is more beneficial than sending a mass email to the entire class in an online course. The importance of technical problems such as a wrong network, tutors' lack of experience with online teaching and the constraints of peer contact, and the personal situations of students and tutors when working and studying from home are emphasized in a study conducted at Jordan University with 615 architecture students (Alnusairat et al., 2020).

Peter et al. (2016) come to the following conclusion when they compare the advantages of traditional and online education in the analysis of their research: it is not unexpected that more colleges are making space available for online training courses because learning independent of time zone and location utilizing online video-based learning is more successful than offline learning technique. However, online course instructors play a variety of functions. They lead or regulate conversations, reply to each student individually and in the class, and control the information flow through assignments and feedback. Their immediateness and presence affect learning and student happiness (Wallace, 2003). Hovirtz (2007) also believes that higher education institutions and other institutions have used and will continue to use online learning extensively. On the other hand, he makes an essential point that future educators and instructional designers should develop their

theoretical knowledge in the field of instructional technology to improve the caliber of these educational experiences.

Blended Learning

Blended learning refers to a combination of activities that call for the actual and virtual presence of students, teachers, and other participants in a learning environment (Fleischmann, 2020). Bender & Vredevoogd (2006) claim that blended learning broadens participation in design criticism as a kind of education to more students, in more locations, and in more ways than previously possible. According to them, students' understanding can be improved by combining blended learning with the traditional studio. Caston et al. (2015) agree that a mixture of traditional and online course delivery techniques would eventually result in the most efficient learning environment, as it accommodates the broadest range of learning preferences and best supports student learning. Students have to have some degree of control over the timing, speed, and location of their education, according to Fleischmann (2020), and this can easily be provided with blended learning.

Instructors feel that using various delivery strategies can considerably improve learning results and raise student satisfaction with the educational process, which has led to a sharp increase in the use of blended learning (Lim et al., 2009). Yet, poor human interaction results in a rapid decrease in learning curves, such as adopting new technological tools, delaying feedback, laziness in learning, and reduced motivation to read online educational resources (Laurillard, 1993, as cited in Lim et al., 2009).

The advantages of both synchronous and asynchronous learning are combined in blended learning, which also provides the opportunity for cross-disciplinary and international collaboration with institutions and professions resulting from the analysis of running an architecture studio in a hybrid, virtual, or online environment (Varma & Jafri, 2020). Also, Iranmanesh & Onur (2021), in the findings of their study, demonstrate that students strongly prefer having a blended studio over both physical and online studios. The findings of her study also highlight the necessity for

academic institutions to devote time and resources to the career development of their design educators in order to ensure a seamless transition to blended or online design education that is more technologically advanced.

2.3.1 Covid-19 Pandemic Effect on Education

An identified virus sparked the Covid-19 pandemic, an infectious disease that first appeared in Wuhan, China, in 2019. In March 2020, the WHO declared a pandemic hitting numerous nations worldwide (Ozturk et al., 2021). Early in 2020, Covid-19 expanded quickly throughout the world. Social segregation was one of the tactics implemented to stop the disease from spreading, which has forced workers and students to work remotely utilizing online services (Ozturk et al., 2021). Following that, without forethought and planning, all learning programs in schools and universities worldwide had to either be suspended for an unforeseen period or switched to a remote, virtual, online manner (Spitz et al., 2020). According to Adedoyin & Soykan (2020), the only alternative available for universities was to take after the governments announced the physical shutdown of institutions as a means of halting the pandemic's increasing prevalence throughout the world community was online learning. However, after the educational institutions abruptly shut down, they were not ready for such a long vacation (Rashid, 2020). Spitz et al. (2020) mentioned that schools and campuses -places for social interaction- were forced to transit to distant learning without planning or preparation, which presented numerous difficulties to educational institutions worldwide.

On the other hand, besides the institutes, students were also not informed in advance of the Covid-19 situation and were not adequately prepared (Rashid, 2020). For instance, in his paper, he gave a place to a survey conducted by students of Southeast University on Facebook with 1072 students from various departments participating in the survey asking for their thoughts on the online classes offered off-campus. It was discovered that 962 students believed that the off-campus class was not an

excellent way to handle the situation, and only 110 students had a favorable opinion of the off-campus class (Rashid, 2020).

The transition of universities to virtual classrooms is in doubt because these mechanisms saw the utter lack of proper preparation, design, and development of online educational practices due to the disease outbreak. Yet, online learning is deeply rooted in effective planning and design of instructions with a variety of available strategies and models (Adedoyin & Soykan, 2020). Another big dilemma for students with different socioeconomic backgrounds is a significant problem for online instruction since schools cannot offer all those requiring computer skills, equipment, and connectivity (Spitz et al., 2020). The initial few online courses cannot be used by course designers (and instructors) to presume that every student would effectively grasp the capacity to understand technical language and learn all technical abilities (Abramenka, 2015).

Yet, in research conducted by Varma & Jafri (2020) after the Covid-19 pandemic in India, only a minuscule 14% of respondents said they found the shift to online teaching tough. In comparison, over 53% said it was extremely easy or easy. It may be because today's students are natural users of the language of social media and the digital world since they are familiar with digital communication tools (Iranmanesh & Onur, 2021).

Teachers will have time to reconsider their profession due to the disruption caused by the Coronavirus, and future generations will continue to benefit significantly from the use of technology in the classroom (Rashid, 2020). Each disaster presents a chance, and this epidemic may be a chance to change from a stale, antiquated educational system to one that values intelligence, vision, inventiveness, talent, and innovation (Varma & Jafri, 2020).

2.3.1.1 Design Education in the Covid-19 Pandemic

Nevertheless, even with sufficient technology, design education has historically been one field that struggles from being entirely online and virtual (Hananto, 2020). It has been difficult for design instructors to adapt this studio approach to an online setting, especially at such a tight deadline because of Covid-19 (Fleischmann, 2020). However, after many sessions, students and lecturers began adjusting their strategies to deal with the current scenario, and holding an online design studio first appeared as anti (Iranmanesh & Onur, 2021).

Schools are setting the type to solely online, which is a complex undertaking in the field of design education, according to Spitz et al. (2020). They believe design education necessitates a mix of conceptual understanding and practical skills for the invention, growth, manufacture, and deployment of things, services, and systems: How to switch all traditional classes to online ones easily. Ozturk et al. (2021) touched upon a study in their research with 103 people during the Covid-19 period; there were both professionals and design students with different design principles. They mentioned that experts saw their processes improved when they were removed from the actual work setting; on the other hand, students discovered that working remotely and being out of the studio/classroom harmed their design processes. They mentioned they could not communicate concepts through sketches or drawings and lacked assessments of the design process over prototypes, which contributed to this. It was challenging to collaborate remotely during the design process's concept development and detail design phases since this resulted in conflict among the students (Ozturk et al., 2021).

Additionally, Fleischman (2020) also mentioned another dilemma students face is; students cannot attend campus workshops and evaluations for making tangible products. In order to address the difficulties of the new every day, innovative, rapid, experimental, and practical learning with scarcity-based thought was used during the epidemic. Therefore, the online teaching approach should be dealt with intense emotional obstacles within and outside the class (Spitz et al., 2020).

Among the most critical conditions for the continued acceptance of online learning is the creation of well-designed courses with stimulating and interactive content, formalized student collab, flexible due dates for the pace of student training, ongoing monitoring of their progress, and the allocation of constructive evaluation when necessary (Siemens et al., 2015).

2.3.2 Online Design Education

At best, teachers who had little to no practice teaching online before the epidemic now consider using specific components of design education online (Fleischmann, 2020). However, in recent years, the Internet's use as a communication medium for advancing education has proliferated (Broadfoot & Bennett, 2003). Furthermore, organizations for online education have already benefited from the Internet's singular capacity to provide quick, open communication over distance. Moreover, online studios are frequently viewed as a more appealing substitute for traditional studio instruction (Broadfoot & Bennett, 2003).

Design students may be prepared to maximize their contribution as designers to the industry; design education should adapt to their altered function in the industry and update its educational material to reflect the changing industry (Budd & Wang, 2017, as cited in Kim et al., 2022).

2.3.2.1 Online Industrial Design Education

While the core of design education has traditionally been studio-based pedagogy with its vital social component, the theoretical foundations of online delivery are now starting to develop. They primarily depend on collaborative tools' effectiveness in simulating the studio setting (Fleischmann, 2020).

The industrial design curriculum offers students many opportunities to understand the user-centered approach. However, if they lack technical skills, they may struggle and lack confidence while working on technology projects (Kim et al., 2022).

In Fleischmann's research in 2020, eight out of ten educators who were asked to remark on design courses that did not match the online paradigm mentioned the inability of online courses to teach skills, such as tactile perception and practical application. Among the workshop skills cited were those required for 3D printing and product design, where students would need to create molds (Fleischmann, 2020). Technical problems, such as poor network connection and unfamiliarity with the new programs, are some causes of students' disengagement (Alnusairat et al., 2020). Because of the instructors' lack of expertise in online teaching and the constraints of peer contact, the personal circumstances of students and tutors when working and studying online are also significant. Together, these elements may make using the online design studio more difficult (Alnusairat et al., 2020). Research conducted by Sekerci et al. (2021) showed that in order to complete their distance learning assignments for architecture departments, 80% (228) of the students reported infrastructure issues caused by internet outages and/or slowdowns, and 64% (181) power outages. Given the nation's lack of developed internet and electrical infrastructure, sustainability in practical courses does not appear to be particularly feasible.

Fleischmann (2020) states that design studio instruction emphasizes the need to share and bounce ideas off one another. Also, students in an entirely online classroom are unaware of this social component. Design is a collaborative process by nature, and online distribution makes it more challenging to supply the human component of that equation (Fleischmann, 2020). Because of the interactions in the studio, she mentions that many design instructors think teaching design online is challenging or perhaps unattainable.

On the other hand, the main advantage of online education is the availability of knowledge resources, whether people or information, "anytime, anywhere" (Budd et

al., 1999). The ability to see the recorded evaluations of students' works looks to be another benefit of the online studio (Ceylan et al., 2020). Students stated that table discussions were changed to reflect online reviews of the instructor on their work; this may allow the instructor to view the students' works from a wider angle. They also include that this change may have resulted in students' developing their work more organized, among others.

Regarding collaboration advantages, we see Budd et al. (1999) because of their expertise with computer-based learning technologies in the late 90s. They think emerging technologies that combine computers and communications might be crucial tools for solving challenging modern design issues. Despite the examples from the past, like those of Budd et al., showing the power of computer-based learning technologies, there are still forms of traditional education in many areas of education. Moreover, Ibrahim et al. (2020) agree that a global audience may now participate in the evaluation of design initiatives as the need for a physical presence is no longer there. Over the years, it has become feasible for institutions from many nations to collaborate with the power of technology. Also, today's students appear to be expanding their learning environment through the Internet's limitless opportunities for sharing information and knowledge (Ioannou, 2017). The value of the physical space is beginning to be doubt (Ceylan et al., 2020). As a result, integrating cutting-edge networking and computer-based techniques into the design studio is required.

Some examples of advantages and disadvantages have just been mentioned. Accordingly, it is not wrong to agree that Fleischmann mentions that online introductory design classes that produce digital products like graphic design and interactive media can be successful. Others that necessitate physical production and workshops are likely to fail in an entirely online scenario. To be presented in a blended learning/teaching style, where the hands-on workshops would be provided in a face-to-face environment, these courses are frequently well-fitted for this (Fleischmann, 2020).

Consequently, Crowther (2013) believes that given the availability of new technology, the studio must be reconsidered because it is no more running successfully. Given the development of fifth-generation online learning and the current online learning implementations, which can make use of a variety of web resources, such as multimedia applications and innovative collaboration and communication technologies, it is necessary to reconsider the dilemma of the effectiveness of online and face-to-face teaching (Means et al., 2013). Based on what Means et al. proved, whether we need online training and customization, online industrial design training should be reviewed, and the requirements and critical points for ID training should be investigated and determined.

2.3.2.2 Online Design Juries

The ability to assess ideas through drawings and models may have limited knowledge exchange, even though collaborative teamwork in the design process is recognized to be achievable with the transmission of knowledge and skills among the associates (Ozturk et al., 2021). Alnusairat et al. (2020) proved that in their work, students hesitated to talk about their projects in groups and at jury sessions. It can be mainly because studying online lacks a personal bond, especially when the webcam is switched off and students cannot see the reviewers' emotions. Additionally, they indicated that a considerable number of students in their survey agreed with the statement that "The quantity of input they are getting is not sufficient" (p. 227), which was verified by past findings demonstrating how students feel about the shortage of feedback. The majority of them, around 70%, preferred the conventional kind of feedback, which was manual drawing based on face-to-face contact with the lecturers, making this connection in the online context challenging (Alnusairat et al., 2020). On the other hand, students who were asked to list their favorite parts of online design classes said they could receive more comments on their work from instructors and peers (Fleischmann, 2020).

When opposed to the original design studio, 59% of the students said that the most significant thing missing from the virtual environment was the face-to-face connection with the instructor and that the videoconferencing did not make up for such reliability (Iranmanesh & Onur, 2021). However, Iranmanesh & Onur, in the list of findings of their study, shows the advantages of distance learning in multiple ways. They believe students hold more control over what is being provided at any time. Also, students are given access to recordings of the juries, allowing them to review the jury's remarks at anytime and anywhere. Additionally, juries allow students a less striking and more focused stage to debate their validity and identity in front of their classmates and tutors. They also pointed out that guest jury members from various design studios, disciplines, and other schools can now participate in common juries regularly.

Furthermore, the recordings of all studio sessions and common juries become accessible to students for examination due to the online teaching experience. In addition to what Iranmanesh & Onur (2021) point out, Bender & Vredevoogd (2006) mention that contrary to having a front seat benefit in a typical classroom, all students are assured of receiving the same display materials and of seeing the lecturer and materials in the same way in jury and critic sessions.

2.3.2.3 Online Design Jury Presentation

According to NZ Day et al. (2022), students will be expected to gain educational and proficient knowledge and skills throughout their academic careers. During higher education, presenting skills must be improved, and practice is crucial to developing abilities. For input from the instructor, classmates, and, occasionally, design experts, students in juries hang their projects on the board or present their designs in a more formal setting (Fleischmann, 2020). According to Ceylan et al. (2020), there has not been a slight difference between regular juries and online ones regarding timing or procedure. No significant difference was found when the study of Ceylan et al. was evaluated in terms of planning and process. However, online presentations have

advantages and disadvantages regarding their dynamics. Below, the disadvantages and the advantages will be explained.

In the study of Alnusairat et al., 2020, most students (71.2%) preferred the conventional after-presentation feedback, including manual annotation, like face-to-face communication with the teacher. Giving feedback like it is done in face-to-face could be challenging because working online lacks emotional connection, especially when the camera is off and students cannot see the reviewers' emotions (Alnusairat et al., 2020). While face-to-face presentations given in front of live audiences may be more successful, online-type ones can help students who cannot follow regular module sessions learn (Kuzma, 2011).

According to Chen & You (2010), in traditional education, design students require a place to exhibit their design work. A sizable area and several resources are needed to arrange a design exhibition using the conventional way. In addition, time and space constraints limit the number of visits. However, as already mentioned, there is no kind of requirements for those in online education. One of the research findings in Fleischmann's paper (2020), during the Covid-19 period, some students indicate that they felt more at ease giving presentations online. Moreover, she adds that these students felt more comfortable speaking in front of the class and more capable of participating. In another research by Kuzma (2011), she uses ANGEL in her online design jury research for students to record their video presentation and submit it directly through the tool.

Furthermore, the following results are:

- When the student's recording is finished, the lecturer plays it back to grade it.
- Lecturers can give textual comments to students and assign grades.
- The student may see the feedback and grades in a window that includes a date and time for each comment as they are played back throughout the session.

Finally, Ceylan et al. (2020) mentioned that an option to see the recordings afterward is innovative and beneficial for education. It is applicable for both jury sessions and critical comments in their paper and pointed out that students also have the opportunity to see different online juries.

2.3.3 Platforms & Tools Used for Online Design Education

There has been a significant advancement in such technologies' affordability, accessibility, and integration into daily life during the previous twenty years (Iranmanesh & Onur, 2021). With an emphasis on systems and communal concerns, many academics and teachers currently employ these innovative methods to aid in design learning and teaching (Chen & You, 2010). Even though they do not reside in the same physical area, participants in practice and education-related studies must communicate to take action and deliberate together (Ozturk et al., 2021). Students can now talk, transmit multimedia content, stream their displays or documents, and engage in collaborative web activity through online tools and platforms (Ceylan et al., 2020). As a consequence of the study by Ibrahim et al. (2020), it was shown that the majority of lecturers and students enrolled in online courses used various video conferencing tools to deliver their work, and they found the simple video conferencing tools as the most helpful ones. For example, the numerical data obtained in the research conducted by Bernardo & Duarte (2020) are as follows: The two most popular choices, Zoom.us (34.78%) and Microsoft Teams (21.74%) are both synchronous. Attendants added YouTube, Slack, Github, Exam.net, Vimeo, Dropbox, and Jitsi as "others." Social media platforms like Facebook Messenger and WhatsApp were frequently used when working together on group projects. They use them because these approachable social media applications are so well-liked, according to Alnusairat et al. (2020). Chen & You (2010) believe increased engagement among students and professors resulted from web design courses. Also, thanks to the Internet, learners can do educational tasks whenever and wherever they want. On the other hand, they cite that the first problem with the distanced education

and Internet is the bandwidth and stability—secondly, expense and handling dilemma of the new pieces of equipment. Lastly, concerning the system, there were some issues with the course web pages' design, organization, and user experience. As an illustration, certain functions were insufficiently efficient while others were less user-friendly (Chen & You, 2010).

Any compelling web-based learning journey depends on choosing the right tools to enable students to interact successfully, evaluate assignments, and interact with the teacher (Abramenka, 2015). Traditional instruction can be enhanced with additional digital resources to create a more substantial blended learning experience (Caston et al., 2015). There is no best approach to integrating technology into the studio because it has benefits and drawbacks as a learning environment; instead, a combination or blend would maximize the benefits already mentioned while minimizing the drawbacks (Crowther, 2013).

Within the context of this study, among the online education platforms in the literature, the most used platforms used in the online education process in the Department of Industrial Design at METU, will be briefly introduced below.

2.3.3.1 ODTÜClass

ODTÜClass is an LMS tool which used in Middle East Technical University. Learning Management System (LMS) tools enable to organize and manage course content, submit assignments, evaluate students, and work in a secure environment free from time and place constraints (Zanjani, 2017). ODTÜClass is a platform that allows users to share sources and allows them to post assignments and online tests. The "gradebook" feature also enables instructors to assess students' academic progress and publish grades for each student during the term. Additionally, it offers email, discussion forums, announcements, and plagiarism detection (“New Learning Management", 2015).

Both instructors and students have access to the robust learning and communication capabilities provided by ODTÜClass. One may control a variety of tasks, like sending emails, sharing quizzes, asking for assignments, and Turnitin tasks so that plagiarism can be checked (“New Learning Management", 2015). In their study, Akar et al. (2012) also mentioned that METU-Online, an online portal, is frequently used by students and instructors to post materials related to university courses. However, they expressed dissatisfaction with the approach because it does not provide any visuals that can be critiqued, which are crucial for design instruction (Akar et al., 2012). It can be said that METU industrial design students use ODTÜClass for many purposes, such as accessing course resources, tracking project calendars, and uploading projects.

2.3.3.2 Miro

In academic teaching, whiteboard tools are used to make it easier for users to interact and collaborate with each other (Brandao et al., 2021). Miro is among the collaborative whiteboard tools. With digital post-it notes for discussions and planning, distant teams may efficiently collaborate online with Miro (Perminova, 2022). Utilizing video chat, presentations, sharing, and other tools with Miro is possible, and also it allows for streamlining cross-functional teamwork and planning meetings and workshops (Perminova, 2022). Beyond being constrained by physical locations or whiteboards, online individuals and groups can collaborate and communicate using remote whiteboard systems (Ozturk et al., 2021). Such platforms make it easier to develop users' initial thoughts and brainstorm potential solutions. Participants can thus keep meeting to exchange and discuss design decisions on paper under the new conditions (Ozturk et al., 2021). It would not be wrong to say that Miro, one of the platforms most used by METU Industrial Design students online, is used for collaborative work in group projects, developing ideas for projects, uploading project boards, and making jury presentations.

2.3.3.3 Zoom

It can be said that the most obvious option for providing a virtual face-to-face experience is to use any video conferencing tool such as Skype, Google Classroom or Zoom (Minhas et al., 2021). Among these, Zoom is widely used in METU Department of Industrial Design. Zoom provides a form of communication that enables users to interact via video, audio, phone, and chat. An internet connection and a compatible device are necessary for using Zoom. Among the primary purposes of Zoom, Fleischmann (2020) includes presentations, group discussions, and teacher and peer evaluations. Zoom was one of the most popular platforms for delivering lectures, starting and ending feedback sessions for assignments, and administering quizzes and session tests (Varma & Jafri, 2020). Minhas et al. (2021) also mentioned the features of Zoom in their research. They found functions like screen sharing, co-annotating, and remote control helpful. Zoom gives out waiting rooms. They believe this feature encourages the instructor to divide the class into numerous smaller groups. Their findings demonstrated that students are most satisfied with the Zoom Application's overall class administration, basic design, and course recorder functions for online classrooms. Apart from conducting all the courses here, online juries in the METU Industrial design department were also held on Zoom. Students and jury members were meeting at the Zoom link where the jury would take place and holding the jury session.

2.4 Summary and Discussion

This chapter presents a review of the existing literature related to aim and research questions. Before addressing industrial design education, the literature review begins by briefly mentioning the origins of design education. The foundations of design education, which is a unique form of education (Ochsner, 2000), in which students present the design solution at the end of a process with studio-based learning, date back to the 17th century (Zeng, 2017). A wide variety of iterative project processes

in industrial design education end with the presentation of the student and the evaluation of the jurors (Hacıhasanoğlu, 2019) in the studio, which is a unique environment (Bender & Vredevoogd, 2006). The studio environment requires mutual communication and interaction between student-student, student-juror and juror-juror in both project development and evaluation processes.

The jury system is a feedback and evaluation tool (Smith, 2011) that can be described as a traditional ritual for industrial design and other design fields (Salama & El-Attar, 2010). Although projects were evaluated only visually in the first emergence of design education, today students are expected to present project deliverables both verbally and visually (Anthony, 1987). The chapter presents a detailed review of resources and research on jury experiences in design education (see in 1.2). Although the design education literature is rich in resources on jury experience, there is no definitive explanation that lists jury dynamics. The researcher identified common dynamics from the jury definitions and narratives of different sources to benefit from when constructing the field study and discussing the field study results.

Jury dynamics can be listed as follows:

- Seating arrangement
- Time
- Presentation
- Students
- Jurors
- Feedback
- Dialogue & wording

Jury sessions, which have been held in a similar order and face-to-face for decades, have been experienced and researched online with the effect of digitalization and Covid-19 in recent years. In fact, there has been a noticeable increase in online degree programs since the 1990s (Wallace, 2003), but online jury sessions are not common in industrial design education. Due to the Covid-19 pandemic, almost all

educational programs around the world have been online since March 2020 (Spitz et al., 2020). This literature review includes research on online education during and after the pandemic along with a brief introduction of the tools and platforms used.

The traditional experience of design juries with unique dynamics and demands differed in some respects due to online execution. Regarding that, the field study methodology was planned to better understand the online jury experiences of both students and jurors. It is valuable for both industrial design education and design jury literature to examine the new facilitating and restrictive experiences of online industrial design juries, where the traditional flow is tried to be maintained with the support of tools and platforms. It is planned to propose potential design directions for online platforms with the contribution of detailed literature review and well-planned field study.

CHAPTER 3

METHODOLOGY

After reviewing relevant resources and previous research in Chapter 2: Literature Review, it was recognized that there was a gap in the literature regarding online jury experiences and the advantages and needs for students and jurors for online jury sessions in industrial design education. Jury sessions are the most fundamental stages where projects come to finalization and are traditionally face-to-face in ID education. Therefore, it would be valuable to provide information to educators and platform designers by examining the online jury experience in depth.

In this part of the thesis, the research methodology is presented. The design of the research, data collection tools/methods, recruitment processes, and data analysis tools/methods are introduced. Each research phase is designed to complement the next; therefore, each phase's findings support and strengthen the others.

3.1 The Design of the Study

For the thesis research, the sample was defined as Department of Industrial Design at METU. The fact that the researcher knew the inner workings as an undergraduate and graduate student was an advantage. The researcher was already familiar with the educational approach, jury method or tools used for both physical and online juries. It is also one of the first industrial design education in Turkey and has deep-rooted experience in this field. (METU, n.d.) And that they all together make METU Department of Industrial Design a good context for this research.

The research aims to examine the experiences of students' and instructors' online juries in industrial design education with particular reference to the METU Department of Industrial Design. In addition, along with a review of what are the

conveniences, challenges, and requirements that the platforms must meet. To do so, this thesis sought answers to two main research questions, including the supporting questions previously discussed in Chapter 1 Introduction.

The two main questions and sub-questions of the thesis study are given below.

1. What are the experiences of students and jurors in online juries in industrial design education?
   - What are the advantages of online juries?
   - What are the needs of students and jurors concerning the limitations of online juries?
2. What are the potential design directions for online platforms with a specific focus on industrial design juries?

The thesis research, which consists of the following two main stages, was designed with the guidance of answering the research questions.

Phase 1 is an observational study. Online juries of all 4 levels of undergraduate education are observed at METU Department of Industrial Design. By doing this, it is aimed to gain a comprehensive knowledge and general understanding of how juries are conducted online. Phase 2 is interviews. The semi-structured interviews aim to gain in-depth insight into students' and jurors' experiences on online juries. The interviews were carried out with 3rd-year students and jury members who participated in their juries. Table 3.1 demonstrates the overview of the research phases.

Table 3.1 Overview of the research phases.

	Methods	**Aim of the Method**
Field Study	Online jury observations	Gaining a comprehensive knowledge and general understanding of how juries are conducted online
	Semi-structured interviews	Gaining in-depth insight into students' and jurors' experiences on online juries
Data Analysis	Thematic coding	Categorizing the data into meaningful parts according to the research questions

Ethics Approval

In this thesis research, an application was made to the Applied Ethics Research Centre of the Middle East Technical University to protect the fundamental rights of the participants who provided data during the data collection process and later in the data analysis stages. The subject, purpose, method, and sample of the research were documented in detail.

Ethics approval (Protocol no: **237-ODTU-2021**) was obtained for the first phase of the research study and another ethics approval (Protocol no: 0020-ODTUİAEK-2022) was obtained that includes the next research plan. Both ethics approvals from the METU UEAM can be found in Appendix A.

In the consent form sent to all users before both research phases, it was stated that ethics approval was obtained to help them feel comfortable in addition to informing them about the research. Informed consent means allowing individuals to voluntarily participate in the research of their own choice. (Lune & Berg, 2017)

3.2 Qualitative Research

While quantitative research methods are applied to reach quantitative, proportional, and comprehensive findings, qualitative research methods are preferred to gain deep insights into experiences (Patton, 2002). Therefore, in this thesis research, two of the qualitative research methods are used: observation and interview. The purpose of choosing these methods is to gain in-depth knowledge of causes, feelings, thoughts, and consequences from those who have experience. The knowledge obtained from qualitative research methods can be shaped by the interpretation of the researcher and interpreted from different perspectives.

The thesis research was carried out in the academic years 2020/2021 and 2021/2022, which is the time when people all over the world were struggling with Covid-19. The

researcher is aware that the data obtained in this process can be interpreted under the influence of the physical, psychological and environmental issues of the participants. It aims to obtain transparent findings by separating the comments considered to be biased when necessary. It contains valuable findings for future research on this subject without the effect of Covid-19.

3.2.1 Observation

As explained earlier, the thesis focuses on investigating how industrial design juries are conducted online. Observation is one of the most effective ways to closely examine how online juries are conducted. Observation is a technique in which researchers follow the participant or organization over some time to see from the participants' perspective, participate in their environment, and experience their situation (Ferguson, 2016). Shadowing is one of the observation techniques that aims to observe the activities of people while avoiding interference.

A comprehensive first-hand dataset will be obtained from the shadowing technique about the picture of the role, perspective, and experience (McDonald, 2005). The key is to take as many notes as you can while observing as an outsider so as not to miss any data such as impressions, relationships, and emotions (McDonald, 2005).

3.2.2 Interview

After observing online juries as an outsider, it is essential to gain in-depth insights from students and jurors who have experienced it firsthand. An interview can be defined as a conversation between participant and researcher to get answers to specific objectives and relevant issues (Lune & Berg, 2017) (Bauman et al., 2002). While the data at the end of the observation can be created with the orientation of the researchers, more realistic data can be obtained from one-on-one interviews with the participants. Semi-structured interviews are one of the interview techniques in

which questions are predetermined but still have a free space where new questions can arise depending on the flow of the conversation (Grossoehme, 2014).

3.3 Observations

The observational study was conducted with 2020-2021 academic year online juries at each undergraduate level at the METU Department of Industrial Design. The sample was planned comprehensively to observe the effect of the year in college (1st, 2nd, 3rd and 4th) on the experience to narrow the scope of the research for the next stage, and to have information about the differences / similarities of the experiences. It has been realized that each level has its educational dynamics and it would be misleading to evaluate them in the same group. Therefore, examining the experience at one level in detail in the next stages and evaluating the observations at the other level as a strong infrastructure will form the basis of the research. The characteristics of each approach used in the research and how they contribute to the study are described in this section.

3.3.1 Pilot study

The main purpose of the pilot study is to create the right sample and the research plan for the actual study. The researcher took part as an observer in the first online jury accessible within the context of the research (2020-2021 Academic year spring semester's 3rd-year ID302 first project's final jury).

The project was carried out collaboratively with a company outside the university and carried out as a team. In a class of 73 people, 18 teams of 4 people were formed. Jury members included the 3rd-year design studio team and guest jurors that both academics and professionals. All students and jury members were informed that the jury would be observed and the consent form was prepared via Google Forms and sent to them via email. One of the limitations of the pilot study was that all team

members had to give consent to use the research data. Unfortunately, only 5 of the 18 teams gave full team consent.

The jury, in which all participants participated from their computers or related devices, took place entirely on the Zoom platform. Also, the other platform used during online jury is Miro. Students, studio team members, and jurors benefit from many features of Miro, such as whiteboard, annotation, timer, collaboration, etc.

In the preparation phase of the observation, a checklist page was prepared in light of the information obtained from the literature and the researcher's predictions. During the jury observation, notes were kept on the hard copy of the checklist paper for each group. The checklist included titles such as group number, presentation order/time of each group member, speaking order/time of each jury, presentation tools, file format, and jury start time etc. In addition, under the poster and physical model presentation titles, there were fields to be filled for product modeling, technical details, picture/text dimensions. In line with the pilot study, the checklist for the actual observations was reconstructed. Due to the repetition of the general information area where the dynamics of the jury will take place, it was decided not to include it on every page. Some detailed information such as the speaking order/time of the students and the jury members and the starting time of the jury have been removed. Due to the need for free note taking in poster and physical model presentations, subtitles were removed and areas where the researcher could take notes according to her own observations were left. Also, the plain white areas where the researcher can freely take notes have been increased.

3.3.2 Sampling & Recruitment

For the observational study, a convenience sampling method was used and the sample was defined as METU Department of Industrial Design. Simply, convenience sampling is made on individuals in the immediate environment and easy to reach, and gives primary importance to generalizability (Etikan et al., 2016). In

the early stages of the research, it will be productive to obtain general insights by keeping the scope broad and to elaborate by focusing on a specific section in the later stages. For this purpose, in the 2020-2021 academic year, the final juries of all levels (1st, 2nd, 3rd, and 4th years) were observed.

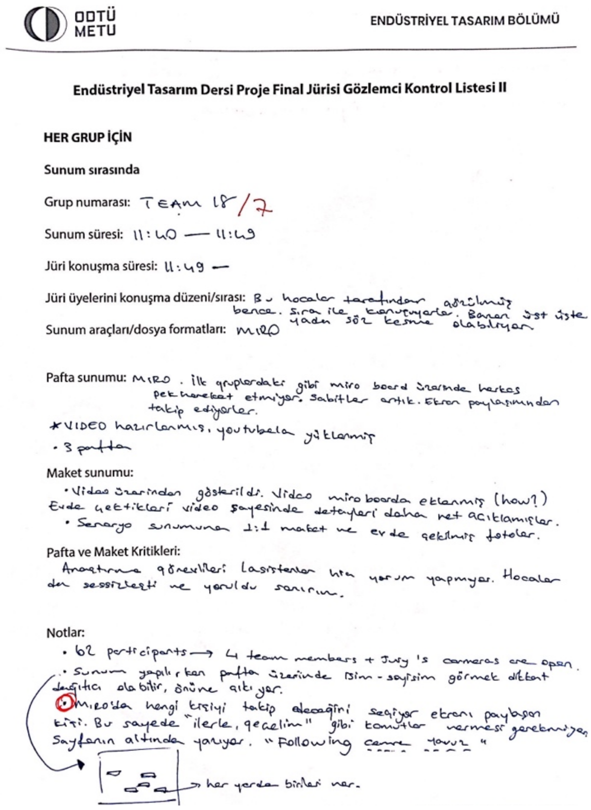
Online consent forms (in English) are prepared with Google Forms and sent to all class students and jury members (both studio team and guest juries) via email (Appendix B). One of the studio research assistants on all four studio teams helped retrieve the names and mailing lists of the class members. While almost all student presentations and jury reviews were observed, only data from those who give consent will be used for data analysis and academic research. The student and jury numbers of all online jury observations are given in Table 3.2, along the topics of the final projects.

Table 3.2 Project topics, number of students giving approval and jury observation durations.

Observations	**Project Topics**	**Observed / Total Number of Students**	**Approximate Durations of Observation**
1st Year Final Jury	Designing a set of cleaning products as souvenirs: a bottle of disinfectant and a bar of soap	**25** / 83 students	6h 15 mins
2nd Year Final Jury	Designing a lesson tool to explain a specific topic in science class for middle school students	**4** / 11 teams	2h
3rd Year Final Jury (First Project)	Designing sustainable solutions for rethinking and reusing waste materials to extend product life span	**5** / 18 teams	1h 40 mins
3rd Year Final Jury (Second Project)	Designing sustainable solutions for encouraging water effectiveness in bathroom environments	**28** / 69 students	4h 40 mins
4th Year Final Jury	The graduation project theme was “Design for Connection”, topics of projects differs for each student	**10** / 36 students	2h

3.3.3 Conducting the Observational Study

As mentioned before, the final juries of all levels (1st, 2nd, 3rd, and 4th years) were observed in the 2020-2021 academic year. Although the aim of this thesis research is not to examine the online jury experiences of each level in detail, it is aimed to gain general insights by participating in the juries of all levels as an observer. The observations helped to observe online juries' advantages, conveniences, restrictions, and requirements. The observation checklist, which was revised after the pilot study, allows researchers to freely take notes alongside the general jury notes, such as the number of participants, platforms, and project details. An example of a filled checklist from online jury observation is given in Figure 3.1.


ODTÜ METU ENDÜSTRİYEL TASARIM BÖLÜMÜ

Endüstriyel Tasarım Dersi Proje Final Jürisi Gözlemci Kontrol Listesi II

HER GRUP İÇİN

Sunum sırasında

Grup numarası: TEAM 18/7

Sunum süresi: 11:40 — 11:49

Jüri konuşma süresi: 11:49 —

Jüri üyelerini konuşma düzeni/sırası:

Sunum araçları/dosya formatları: MIRO

Pafta sunumu:

Maket sunumu:

Pafta ve Maket Kritikleri:

Notlar:

Figure 3.1 An example of filled checklist.

Although each of the 4 jury observations had its characteristics and experiences, they had many common points and common jury notes. All online juries took place on

the Zoom platform (see in 2.3.3.3) and all students prepared their presentation boards on the Miro platform. Zoom has many features that meet the requirements of the online jury, such as video/audio calls, screen sharing, countdown timer, and drawing on the screen. In addition, Miro features are very helpful in both the preparation and presentation stages of the online juries.

All juries lasted from approximately 9 am to 6 pm, which was cognitively exhausting even for the observer. Almost all jury members' cameras and microphones are on every time, however, students prefer to open them just when they present. When it was their turn to present, the students shared their presentation boards using the screen sharing feature of the Zoom platform. While presenting, they showed the place they were talking about by zooming in and out. After the students finished their presentations, it was the turn of the jury members and they gave feedback to the students about their projects. Specific timeframes of around 5-10 minutes (depending on class size and whether projects are individual or group) for both student presentations and jury feedback are set so that all students in the class can present at the end of the jury day.

It was observed that different methods were used for the jury members to give efficient feedback and convey their thoughts about projects. For example, one juror drew ideas on paper and showed them to the computer's camera, while the other drew on students' project images using the pen tool feature in Miro.

It would be very difficult to do all the presentations in one day, as some classes are too crowded for the number of students. So, the studio team organized sections for the jury plan with the help of the Breakout room feature of the Zoom platform. There are different numbers of user-set rooms in the same Zoom link, and participants can easily switch between them. Due to the ethical approach, the researcher should only observe the presentation of the students who gave consent, breakout rooms helped the transition of students from different sections to observation.

1st year online jury observation

For 1st-year students, the project is an individual project designing a set of cleaning products as souvenirs: a bottle of disinfectant and a bar of soap. The project aims to explore three-dimensional forms with clay and soap materials by abstracting the movement and visual features of the chosen place. Eighty-three students were divided into two sections which meant two breakout rooms. The first breakout room consisted of 41 students and 10 students were observed while the second consisted of 42 students and 15 students were observed. The researcher switched between the breakout rooms according to the previously learned jury presentation order list. The studio team consisted of 7 people, including instructors and research assistants. In addition, there are guest jury members in each section.

All student posters were archived on the same Miro board and arranged in the order in which the posters were presented. A research assistant from the studio team shares the screen and monitors the presenter student's movements on the Miro board. All students prepared their posters in the determined layout. Physical models were made from clay and soap and their photos were added to the poster. Since it is a Form-based project, all students took a 360-degree video of their physical models and added them to the poster. Jury members gave feedback on the design decisions and the form of the phsical models. They drew on the poster using Miro's pen tool, especially when giving feedback on form, curve and size. Also, time control is provided by the countdown feature in Miro.

2nd year online jury observation

For 2nd-year students, the project is briefly designing a lesson tool to explain a specific topic in science class for middle school students with the collaboration of *Ders Aletleri Yapım Merkezi* (Course Tools Making Center). The project was completed with teams of four and there was a total of 11 teams. One of the limitations of this jury is there were only 4 teams in which all team members gave consent forms. The employees of the collaborating company came as guest jury members. Even though the student presentations were in English, the guest jurors did not speak

English very well and they often spoke Turkish. All teams prepared a video describing the usage scenarios of their projects, and watched this video before presenting their board on Miro. Each group's Miro board link was sent from the and participants could examine the board on their own or watch the shared screen. Research assistants were responsible for controlling the time and setting the timer alarm on Miro. 25 minutes were set for each team presentation and jury comments, there was little time left for jury feedback after student presentations.

3rd year online jury observation

The 3rd-year final project is developing sustainable design scenarios and solutions to increase water efficiency for bathroom environments. Students individually develop water-efficient design solutions that consider user needs, preferences, and behaviors in the bathroom area.

As the class consisted of 73 students, the final jury presentations were divided into 3 sections (breakout rooms), each with at least 2 members of the studio team and guest jury members. The researcher switched between 3 breakout rooms to observe the students giving consent in different sections and to observe the dynamics of the juries in different sections. The student who took the turn of the presentation shared the screen and made a poster presentation. 15 minutes were set for each presentation, and the countdown on Miro was started by the research assistants when the student started presenting. All students had prepared a main and a technical poster. Most of the students started the presentation by opening the video describing the product. Many students added images in different concepts to the background of the camera in Zoom. At the end of the jury presentations and jurors' critiques for each student, everyone was asked to open their camera to take the jury photo, and a screenshot was taken from the Zoom screen.

4th year online jury observation

For the 4th-year final project at METU Department of Industrial Design, all students collaborate with a company or an organization for a semester and present their final

project. Therefore, almost all students' project topics are different from each other according to the work area of the company or organization they collaborate with and their interests. The graduation project topics of the 10 students who approved the consent form for shown in Table 3.3.

Table 3.3 10 observed students' and their working areas for graduation project.

4th Year Students	**Working Area**
Student 1	Health
Student 2	Household appliances
Student 3	Household appliances
Student 4	Kitchenware
Student 5	Household appliances
Student 6	Household appliances
Student 7	Household appliances
Student 8	Health
Student 9	Household appliances
Student 10	Defense industry

The class of 70 students was divided into 2 sections for the entire semester: Section A and B. The consent form was sent 36 students of Section A. The studio team was contacted and with their help, an informative and consent form was sent to the class. Since this project is a graduation project that needs to be prepared intensively for 4-5 months, it can be predicted that the students were very busy especially in the last weeks and therefore the number of students who approved the form was very few. The screen sharing in Zoom is done by research assistants, not students. All students prepared video for their projects to visually inform the audience about the process and project details. In addition, the research assistants added a time counter for jury time to the video frames in Zoom. At least one employee from almost all collaboration companies participated as guest jury members and gave feedback to the projects of the students they worked with. Some jury members gave written feedback and sent it via chat on the Zoom platform.

The valuable notes in the four completed observations will be the light for the next research phase, the interviews. Also, research questions were slightly revised according to observation notes.

3.4 Semi-structured Interviews

This section clarifies the second phase of the thesis research. After completing the four jury observations, semi-structured interviews were conducted to gain in-depth information about students' and jurors' experiences, feelings, and thoughts. While conducting semi-structured interviews, the researcher tries to reduce their effects on the conversation and structure them to reach meaningful findings of the research (Bauman et al., 2002).

The interview questions were organized taking into account the research questions, the observation phase, and the existing literature. Interview questions were formed in line with the first phase research notes of the researcher. For example, it was observed that the students used the unknown features of the platforms they used in their jury presentations, so questions were prepared about the features they benefited from and how/where they learned them. Another example is the identification of some questions about time management of each jury presentation and jury critiques because different solutions were observed to control time. Semi-structured interviews combine closed and open-ended questions frequently followed by why- or how-specific questions (Adam, 2015).

A total of 13 semi-structured interviews, eight students and five jurors, were conducted. The interview sessions were recorded for transcription and data analysis. Digital recording, if permission is given, allows the interviewer to participate more actively in the conversation rather than focusing on writing down the participant's answers (Adams, 2015). The average duration of each 13 interviews was approximately 60-70 minutes. For the participants to feel comfortable and to convey their experiences, feelings, and thoughts transparently, it was organized that the interviews should be in the form of a sincere conversation. At the beginning of the

interviews, before starting a candid conversation, the participants were informed about the research topic, purpose, methods, etc. information was given clearly. This information was pretty much the same at the beginning of each interview, and the issue of confidentiality was explicitly addressed as is typically suggested for interviews (Adams, 2015). The introductory speech of the researcher in the interviews is given below.

"As part of my master's thesis at METU Industrial Design Department, this research study is designed to determine the research and design criteria of my thesis, which is about "Online jury experiences in industrial design education", in a user-oriented manner. The study has been designed as an online interview of approximately 45-60 minutes, and you will be asked to share your online jury experiences during this process. I would like to take voice recordings and notes to analyze at the next stage of the research with your consent. The interview will be kept confidential."

As the research took place during the Covid-19 pandemic period restrictions, the Zoom platform was used to conduct online interview sessions. In the online interviews, the microphone and camera of the participant and the researcher were always on. Interview recordings with an average of 60-70 minutes were uploaded to the Transkriptor platform and verbatim transcribed. Transkriptor is an online platform that allows you to reduce the time load by automatically converting audio or video to the draft text. After receiving the draft texts from the transcript tool, it took approximately 2-3 hours to prepare the transcripts of each interview with the correct dialogue, vocabulary and spelling.

3.4.1 Sampling & Recruitment

As explained previously, 13 semi-structured interviews are completed after the observational study. It was noticed in jury observations that each undergraduate level has its dynamics, so it would not be a very realistic approach to include all of them within the scope of this research. For this reason, the sample of the research was determined as the 3rd year students and the jury members participated in their juries.

The sample can be described as using a smaller group to make inferences about a larger population (Lune & Berg, 2017). The reasons for preferring 3rd year to other levels:

- The researcher had the chance to observe their juries twice. One of them was a team project and the other was an individual project. The two observations and their notes would help have more insights as an observer about their experiences and make comparisons with interview notes.
- 3rd-year students have a broader experience with both face-to-face and online juries. They received critiques from jurors by making presentations on more than 5 online juries and more than 5 face-to-face juries.
- As a researcher, it would easier to reach them from the social environment. A convenience sampling method, in which the subject selection based on accessibility, was used. (Etikan et al., 2016) (Lune & Berg, 2017)
- As 3rd year project presentations included 3D modelings, renderings, mock-ups, and presentation boards, it would be more comprehensive to observe at the same time.

The class mailing list was requested from design studio assistants to reach the thesis research participants and all students (73 people) and some of jurors (5 people) were asked whether they wanted to participate in the research in the consent form (Appendix C) sent by email. One of the limitations of the study was that only a few students responded to the email that they had approved to participate in the study. To reach the planned number of participants, at the end of the study, the students were asked whether they could help increase the participant number and if they explained the research to their close friends.

Interviews were scheduled in a short time, as online interviews greatly reduced the time and place constraints and planning difficulties. However, it was difficult to arrange an available time for the jurors as it coincided with the last weeks of the academic semester.

3.4.2 Interviews: Students' Perspective

After completing the jury observations, the time between the two research phases was determined to be short so that students would not forget their jury experience. Eight semi-structured interviews were carried out with 3rd-year students at METU Department of Industrial Design in the 2020-2021 academic years. The purpose of this phase, which is very valuable for the data collection part of the research, is to have one-on-one conversations with the students and gain detailed insight into the online juries that they attended. Interview questions were prepared in such a way that research questions can be answered at the end of the research. Interview questions are divided into four main groups and their subgroups. (Table 3.4)

Table 3.4 Question sets from interviews with students.

Question Set	**Aim**
Question Set 1	Demographics
Question Set 2	Preparation stage of jury
Question Set 3	Jury presentations, dynamics, and feedback sessions
Question Set 4	Overall evaluation and comparison

In the second group of question sets, there are questions aimed at obtaining information about the preparation stage for the jury. The third group question sets aim to learn everything that students experienced, feel, think and say in many different subheadings. And finally, students are expected to make some comparisons and make suggestions to improve the online jury experiences.

The main sub-topics of the interview with students are given below. The detailed interview guide and question sets are in Appendix D.

- **Demographics**
- **Preparation**
  - Platforms used in the preparation phase

- Communication and interaction

- **Jury day**
  - Set-up
  - Platforms used in jury presentation
  - Time management
  - Mock-up presentation
  - Visual Quality
  - New solutions
  - Technical problems
- **General assessment**
  - Comparison of group and individual
  - Comparison of face-to-face and online
  - Suggestions

3.4.3 Interviews: Jurors' Perspective

Juries in design education are an experience with two main subjects, in which the students and the jurors play an active role. After the eight student interviews were completed, five more interviews were held with the jury members. Table 3.5 shows the role of the interviewed jurors in the 3rd year juries.

Table 3.5 Juror interview participants' information as jury members.

Participants	Role	Title
Participant 1	Studio team	Res. Assist.
Participant 2	Guest	Res. Assist.
Participant 3	Studio team	Prof. Dr.
Participant 4	Studio team	Res. Assist.
Participant 5	Guest	Assist. Prof. Dr.

Almost all juries in the METU Department of Industrial Design have guest jury members. It would be valuable to ask about the experiences of the guest jury members, rather than just the experiences of the studio team.

The jury members in the studio team often have an idea of the students' projects over a few weeks and thus the details of the project they produce, but the guest jury members see the projects for the first time. It has been added to the interview plan for the guest jury members in the online environment that they listen to, understand, and criticize a project they have never seen.

The main sub-topics of the interview with jurors are given below. The detailed interview guide and question sets are in Appendix E.

- **Demographics**
- **Preparation**
  - Preparation as juror
  - Communication and interaction
- **Jury day**
  - Set-up
  - Platforms used while given critiques
  - Time management
  - Mock-up presentation
  - Visual Quality
- **General assessment**
  - Comparison of face-to-face and online
  - Suggestions

3.5 Data Analysis

Data analysis in this thesis study consists of two stages. First, the transcription of the audio recordings collected during semi-structured interviews and observation notes.

Second, analysis of data from observations together with the semi-structured interviews.

The analysis of the thesis study started with the analysis of the observations, which was the first stage of the study. The data gathered from the observational study analysis helped to better guide the next phase; the analysis of both students' and jurors' interviews.

3.5.1 Data Transcription

As stated by Brinkkmann (2013), transcription is the transfer of video or voice recordings to writing mediums and it is part of the data analysis process. Along with the pilot study, a total of 5 online jury observations were made. During the observation, a checklist was prepared by the researcher before the online jury observations in order to guide to find the answers to the questions of this thesis research. The checklist included both questions to be answered and a blank space for the researcher to freely note or draw. Before all the jury observations, a checklist was printed out as the number of groups for the group project or the number of students in the class for the individual project. During the jury observations, the researcher answered the questions in the checklist and took notes about the observations. The empty version of the checklist is in Appendix F. The notes that the researcher took quickly during the jury observations were transferred to Google sheets to be ready for analysis.

In this study, the interviews were carried out on the Zoom platform and they were recorded by recording feature of Zoom. Recordings transcribed on Transkriptor which is a tool that converts audio recordings to text. Although the transcription device worked with relatively high accuracy, it was not considered successful in generating a complete transcription. Therefore, the voice recordings of all interviews were listened to again and the transcriptions taken from the Transkriptor were manually edited line by line. The researcher's personal editing of the transcripts and

re-listening to the conversations helped to assimilate the data and spot some sentences that were overlooked during the interviews. It was ensured that all audio recordings were correctly translated word for word so that no detail was overlooked. Transcriptions, which are text documents in which the communication between the researcher and his participants were transferred (Widodo, 2014), there was a special google document for each interview to be ready for data analysis.

3.5.2 Content Analysis

Thematic coding turns the original data into meaningful parts by reducing its volume (Rivas, 2012). In other words it is the strategy in which data is categorized for analysis (Saldana, 2015). Thematic coding method was used for content analysis of both observations and interviews. As Boyatzis (1998) explained, themes can be formed inductively from initially raw information or deductively from previous research. Two different thematic coding methods were used in the analysis of this thesis research: inductive coding for observations and deductive coding for interviews.

After the observation notes were transferred to the google docs, the notes of each observation were coded so that the first set was completed. Inductive coding, which allows to establish clear connections between the evaluation and research questions and the findings obtained from the raw data (Thomas, 2006), was preferred for the content analysis of observations. After the first set was completed, all jury observation notes were checked from start to finish as the second set. The observation notes highlighted in the document were interpreted simultaneously considering potential themes for the interview analysis. The initial codes have emerged that will help answer the research questions and guide the creation of codes for the analysis of the interviews.

The codes that emerged as a result of the observation analysis were transferred to the Miro board with a post-it each. To create the infrastructure for interview coding, the

relevant codes were grouped with Affinity Diagram and main themes were titled. (Figure 3.2) The Affinity Diagram is a tool that helps to classify the codes into common themes where the relationship between them is evident (Gkatzidou et al., 2021).

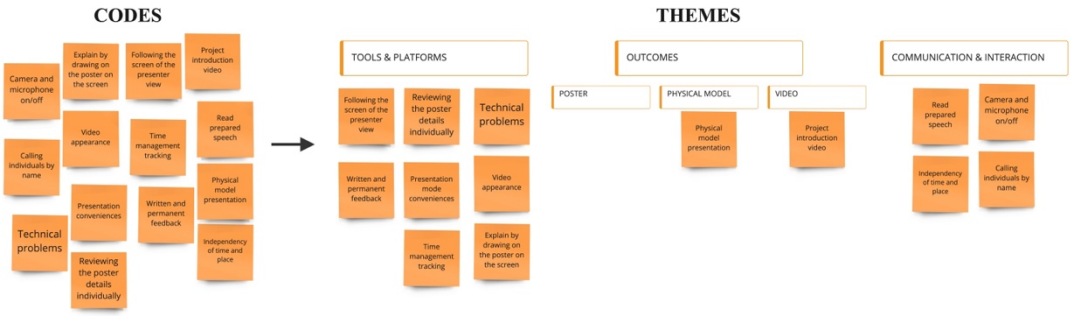


Figure 3.2. Affinity diagram of the codes from observations analysis.

An initial code tree was created with the codes from the analysis of the observations and the codes listed by the researcher under the relevant themes. In the content analysis of the interviews, deductive coding, in which at least some themes were developed by using previous research and researcher intuition (Rivas, 2012), was preferred. While all thirteen interview transcriptions coding are done for the first step, some previously unpredictable codes and segregated codes for students and jury members have been added to the code tree. All interviews were rechecked with the enriched and finalized code tree and coding was done as the second set.

For the documentation and analysis of the data, the Airtable tool was used to organize the observation notes and interview excerpts with the relevant codes and some other information. The Airtable grid had cells for participant statements, participant number, researcher notes, codes, and themes (Figure 3.3).

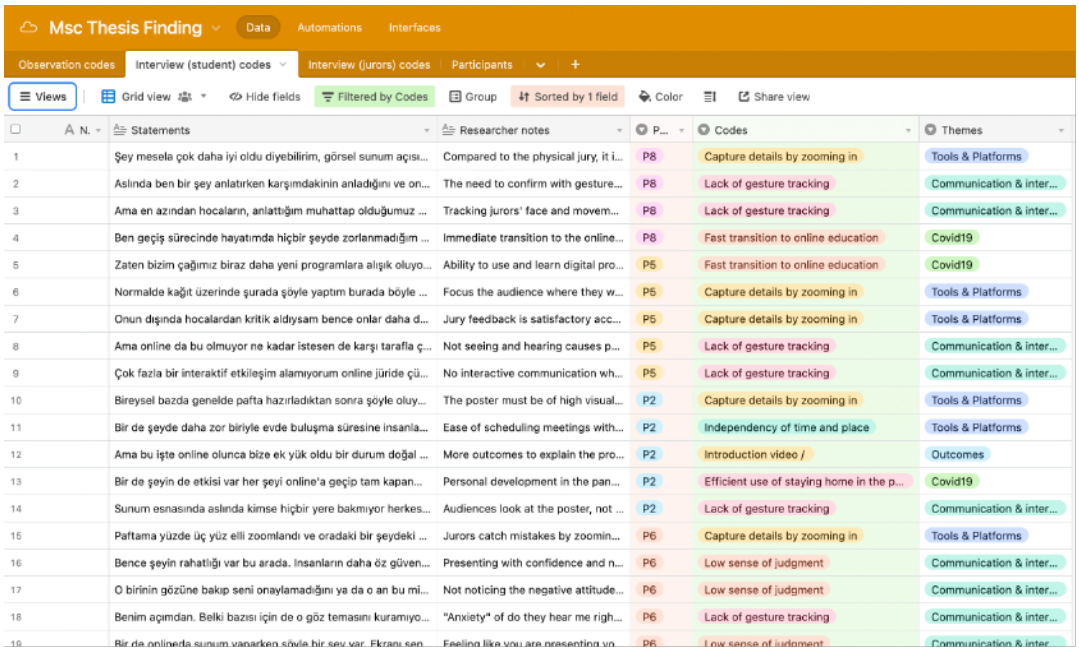


Figure 3.3. The Airtable sheet for data analysis.

As explained earlier, some of the codes in the final code tree were formed during the analysis of observations phase, and in addition to these codes, new codes were added to create a code tree for analysis of interviews. In the first set analysis of the interviews with students and jury members, different codes that emerged from the transcription of the interviews were added. The final code tree is given in Figure 3.4, along with similar and different codes from observations, interviews with students, and interviews with jurors. The findings obtained from the interviews were explained by grouping the related codes under themes. These groups created the sub-themes.

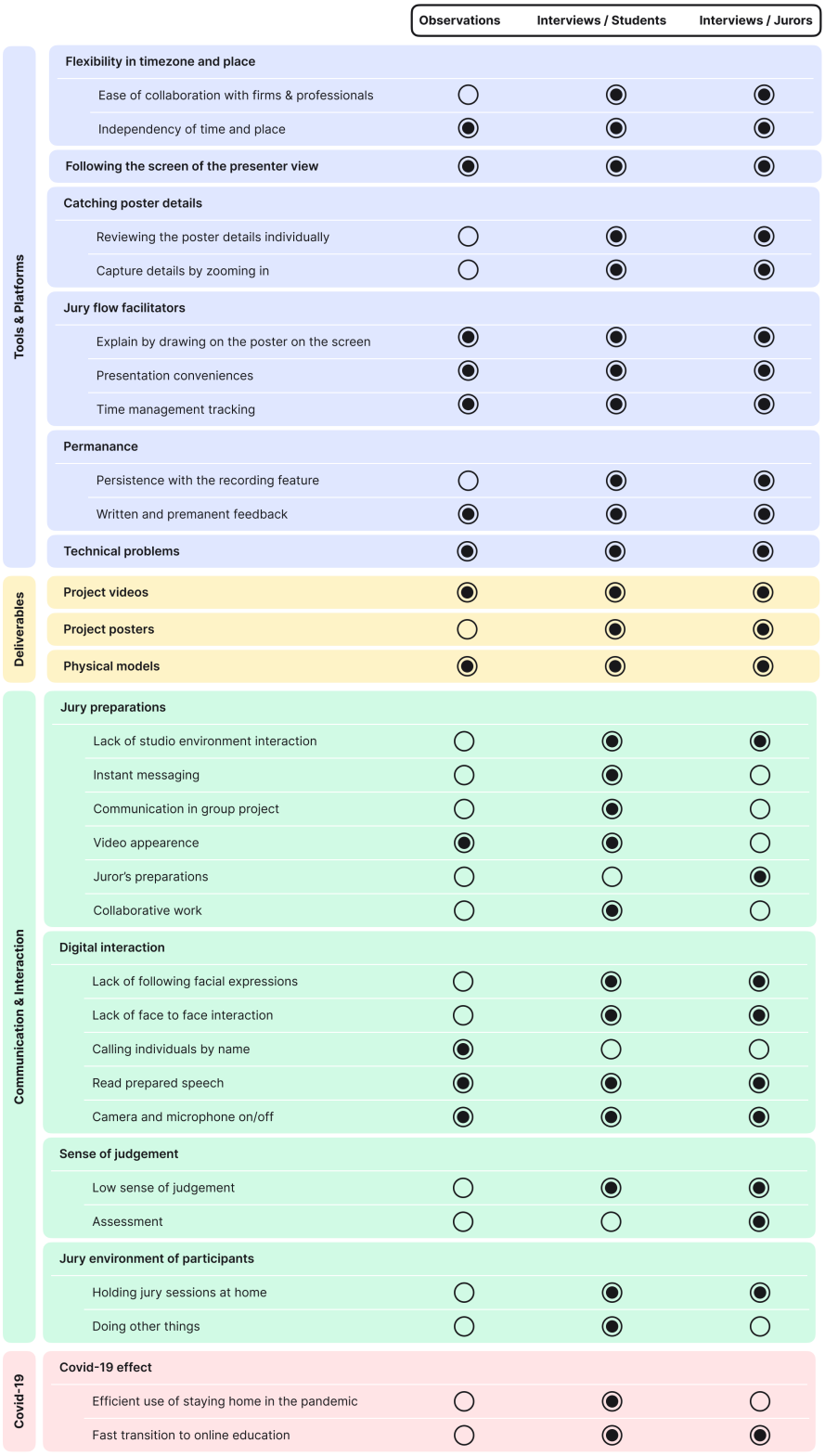


Figure 3.4. List of code and themes along with the research phases.

3.6 Limitations of the Research

The research of this thesis was carried out during the pandemic period and during the transition from pandemic to normalization. Therefore, the pandemic conditions caused certain limitations for the study. The pandemic had a particularly compelling effect on the sampling process. Informative emails were sent to the studio team of each year to observe the online juries and permission was obtained. In order for the observation notes to be used in the thesis research, the consent of the students was required. Therefore, a consent form was sent to each student, explaining the research topic and methods, and containing ethics approval. The number of responses was very low, as the consent form was sent to the students during the jury preparation process, where they were very busy. Especially in group projects, since the approval of all group members is required, the number of jury presentations that can be used as research data was relatively low. Two out of five jury observations were group projects. Similarly, an e-mail was sent to the students in the sample group for the interview phase and unfortunately only two students responded to the e-mail sent for the first time. Students whose interviews were completed were asked to encourage their close friends to participate. With the support of studio instructors and participants, the targeted number of participants was reached in order to obtain rich data.

As the thesis research took place under Covid-19 pandemic conditions, some of the participants were hesitant to conduct face-to-face interviews. All 13 interviews were conducted online. Although the interviews were completed on the video conference platform with the camera and microphone turned on, the participants were a bit timid at the beginning of the interview as there was no face-to-face interaction. The researcher helped the participants to express their feelings and thoughts comfortably with ice-breaker questions at the beginning of each interview. Also, in some online qualitative research methods, potential data may be lost due to the lack of face-to-face interaction and difficulties in tracking facial expressions and body movements (Lune & Berg, 2017).

CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter explains the findings of the field research which contains two phases: observations and interviews. As described in Chapter 1 Introduction, the field research aims to examine the experiences of online juries of students and instructors in industrial design education, along with suggestions for possible design directions for online platforms with particular reference to the METU Department of Industrial Design.

The findings of the field research data are categorized under four distinct themes. These themes are *Tools & Platforms, Deliverables, Communication & Interaction, and Covid-19.* Firstly, the theme *Tools & Platforms* provides data on the features of the digital environments in which online juries are conducted and their effects on online juries. The *Deliverables* theme focuses on the outputs that students present in online juries and are evaluated by the jury members. The *Communication & Interaction* theme investigates how mutual interaction is provided between the jury participants from a distance and in the digital environment. Finally, the *Covid-19* theme briefly touches upon the pandemic period, which caused the juries to be held online. After both observation and interview findings are explained in detail and with examples, each theme will be discussed.

4.2 Findings of the Field Study

In the following sections, the findings of the observations and interviews will be presented according to the frequency of notes on the codes and the importance of the codes from the researchers' point of view.

Observers can take note of both everything and certain predetermined parts of what is going on around them during observation (Busetto et al., 2020). Observation notes can include explanations, metric data, and subjective comments (Berh, 2004) and also things that seem unimportant because it is difficult to determine their importance without the big picture being developed (Ostrower, 1998). Findings were reached by analyzing the researcher's observation notes as a result of participating in the juries. In non-participant observations, the observer is not a part of the situation and tries not to affect the environment with his/her presence (Busetto et al., 2020). The codes were retrieved from the analysis of observation notes as explained in Chapter 3 Methodology. In the following sections, the findings of the observational study will be presented according to the frequency of notes on the codes and the importance of the codes from the researchers' point of view.

As clarified in Chapter 3 Methodology, semi-structured interviews were conducted with thirteen participants following the observational study. Since there are two main characters in jury sessions, which are students and jurors, a total of thirteen semi-structured interviews, eight students and five jurors, were completed. The main aim of the interviews is to gain in-depth information about students' and jurors' experiences, opinions, and thoughts.

Before starting the interviews, the participants were asked to answer the questions mainly based on two 3rd-year jury sessions in which the researcher participated as an observer. It is aimed to be aware of whether the participants' experiences confirm the observation notes or not. The online jury experience that students and jury members generally participate in is just as valuable as their experience on observed juries. Therefore, interview questions include questions about both general experiences and specific to particular jury sessions.

There are some codes and themes that emerged when analyzing the observational study. Interviews were analyzed and coded to further examine these codes and themes. To analyze the interviews, a new code tree was created by adding new codes in addition to the codes from the observational study. In this code tree, many codes

are common in observations, student interviews and juror interviews, as well as differentiating codes. The findings obtained from both observations and interviews are explained by grouping the relevant codes and creating sub-themes.

4.2.1 Tools & Platforms

The "Tools and Platforms" theme consists of findings for tools and platforms used in online juries and their features. Figure 4.1 illustrates the code groups under the main theme of *Tools & Platforms*. Zoom and Miro were generally used in the METU Department of Industrial Design, which is the scope of this thesis research. Jury sessions were held on Zoom so that participants could join with the link sent to them. The project posters in Miro were presented to the jury members by the students.

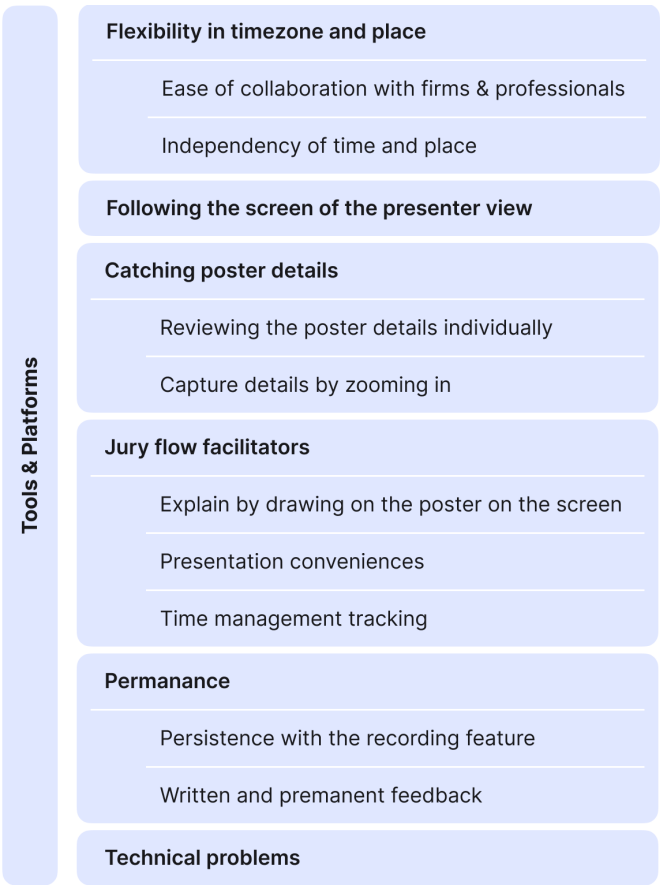


Figure 4.1. The code groups of Tools & Platforms.

4.2.1.1 Flexibility in Time Zone and Place

The Department of Industrial Design at METU held juries on the Zoom platform during the pandemic. Participants, such as students, lecturers, and guest jurors could join by clicking on the Zoom link sent to them before the jury day, at the scheduled jury day and time. Due to the large number of students in the classes, most of the juries were divided into sections. Different sections were entered through the same jury link and separated by break-out rooms with the Zoom feature. The number of break-out rooms in the observed juries varied between 2-4 depending on the class capacity. The students, who were waiting for their presentations or passed their turn, visited the other breakout rooms and watched the jury presentations and critiques of their classmates. They participated in the jury presentation they wanted as an audience without changing their physical environment. As long as the invitation to the platform where the online jury will take place is sent, the participants of the jury can participate *without having to be in the same place and at the same time zone*. In their articles, Iranmanesh & Onur (2021) emphasized the importance of guest juries from different schools, disciplines, or various design studios. This advantage was also noticed in the observational research, that almost all online juries had a *collaboration project with a company* or there were guest jurors from different cities. Many jury members of the interview participants believe that being able to invite a guest jury without the need for travel will contribute to the development of industrial design students. They find it valuable that students receive comments on their projects from academics and professionals working in different fields from different cities or countries. Participant 13 believes that inviting guest jurors will increase the quality of industrial design education.

> *"Online juries had a very serious advantage in terms of being able to call different jury members. In other words, we can now invite members of the jury from abroad. This is a very important advantage. So, you can work with many 'to-do point people' related to that subject. It is a situation that will increase the*

quality of both industrial design education and juries." P13, Juror

Also, Participant 12 supports this feature and predicts that it will benefit from this advantage in the future.

"For example, it is very difficult to bring an academician from abroad in regular juries. But you post a link and he/she can connect to the online jury. From now on, I think that because of this feature, face-to-face and online juries will progress hybrid." P12, Juror

4.2.1.2 Following the Screen of the Presenter View

The students presented the project posters they prepared in Miro by sharing the projects with the jury members on Zoom. The course assistants undertook this screen-sharing task in some jury sessions. While explaining the details of the final project during the presentation, they zoomed in on the place they were talking about at that moment. And they allowed the participants to see only the place they were talking about. It would not be wrong to say that the screen sharer controls what the viewers see specifically. For example, in the observations, it was noticed that the students made sentences beginning with "As you can see..." many times. Here, the student is sure that the audience can only examine the place shared by them. Participants pointed out that in face-to-face juries, the poster of the project was hung on a large board and the jury members both looked at the places the student was pointing at and at different places. While most participants believe that this feature is an advantage for presentation quality and efficiency, few of them believe that this feature restricts the jurors. For example, Participant 2 and Participant 5 think that:

"The listener understands very well where, when, and what you are talking about by looking at the screen. When presenting face-

to-face, it is not known exactly where you are pointing that finger." P2, Student

"There are fewer distractions when presenting online. Instructors only see the screen I want them to focus on, so I think it's better." P5, Student

Contrary to these thoughts, a jury member from the interview participants thinks that it is difficult to follow the shared screen to understand the project they will evaluate.

"It is much easier to follow and understand the project in the physical jury. Because we can see both the whole and the part at the same time. We can't see it as close as on the shared screen, but considering that the jury members are sitting at the front, we can see the details of that poster if it is in an ideal font and resolution." P12, Juror

On the contrary, it was observed that the participants also examined the poster details individually, not from the presenter's screen. The Miro link, which includes the project posters of each student or each group, was shared in the Zoom chat box. Participants could go to this link and capture details by zooming in individually. In addition, while the internet quality of the screen sharer was low, the image quality also decreased, causing the solution to be followed from the Miro link. While one juror asked questions, the other juror tried to clarify questions in areas such as technical drawing, storyboards, or rendering details.

4.2.1.3 Catching Poster Details

This code means being able to *zoom in on the digital project poste*r and examine its details in online juries. Students share the screen and explain the project process and product details to the jury members for evaluation and feedback. It can be said that it is important for the jury members to have a good grasp of the project details to give efficient feedback, such as product junction points, technical drawing, human

interaction in scenarios, etc. As mentioned in Chapter 2 Literature Review, in physical juries, project posters are usually hung on the board, and jurors review details from their seats some distance from the board. Participant 11, a juror from the Interview participants said the following while comparing the physical and online juries on this issue:

> *"There is a poster in the distance in the physical environment. Unless you go close to the poster in every student presentation, it is of course not possible to see those details."* P11, Juror

Five out of 8 students stated that zooming in on the details on the poster while making a presentation to the jury members affected the poster preparation process. This situation caused the students to be very careful not to miss the small mistakes while preparing the posters and to pay extra attention to the visual quality.

> *"In the online jury, much more care and attention should be paid to the quality of the posters, because the jury members zoom in to capture even the smallest details. They may not see them because they sit far away from the physical jury."* P2, Student

Miro links, where each student's poster is included, were shared with the jurors. In some juries, Miro links were shared before the jury day, while in others it was shared during the jury session. Therefore, the jury members were also able to *zoom in on the project posters individually*. Participants feel that being free to choose where to review the project poster is similar to the experience of a physical jury. Participant 10, who is a member of the jury, stated the following:

> *"As in the physical jury, we should be able to look, review and examine wherever we want in the online jury."* P10, Juror

In addition, it is considered an advantage that the jury members can access the project posters before, during, and after the jury via the Miro link and can be examined by getting closer to the details.

"Sometimes Miro links are before the jury day. This is not something we encounter very often in the physical environment to preview the posters. It's nice that we can review it before, during, and after the jury to make sure the juror evaluation is done efficiently." P11, Juror

"Miro provided a huge advantage. I think it was an advantage in terms of juries being able to approach and look at the computer screen, read in detail, or look back." P12, Juror

Participant 13 stated that they started to conduct face-to-face juries, and they continued to maintain this advantage.

"We also want a poster describing the project processes in the face-to-face jury and we take the final submissions to Miro. While giving feedback on the jury session, students open Miro with a projector at the back and show the details there." P13, Juror

4.2.1.4 Jury Flow Facilitators

It would not be wrong to say that there is a flow from the introduction of the details of the projects by the students in the industrial design juries to the feedback from the jury members about these projects. This traditional flow continues in online industrial design juries. As mentioned earlier, in the METU Department of Industrial Design, juries are held on Zoom, the video conferencing platform. As stated before, the participant group consisting of students and jurors continues the jury flow on the video conference platform. Ibrahim et al. (2020) mention in their research that students and lecturers find it very useful to use video conferencing platforms to present their work.

The code group titled “Jury flow facilitators” includes platforms used in online juries and their features. In addition to the platform features that students and jury members benefit from, the jury flow also includes negative thoughts about these features.

As is also explained in the observational findings of the thesis research, students and jurors benefited from the *presentation convenience* features of these platforms. The jury begins with the student presenting the screen using the screen-sharing feature. In the jury observations, it was observed that the students made presentations using the presentation mode feature of the Miro platform. Interview questions included their thoughts on this feature and their motivation to use it. All 8 students stated that they used this feature while presenting their project. With the presentation mode, the students define the frames and frame flows they determined before the jury presentation on the posters. Participant 1 believes this feature makes the presentation more impressive.

> *“In the presentation mode, we determine the frames, and we can make a more remarkable presentation. It’s just like PowerPoint, but as an extra, we can zoom in/out to each frame during the presentation.”* P1, Student

In addition, Participant 4 and Participant 8 expressed their satisfaction that the audience only saw the specified frames and did not see other distractions on the screen.

> *“The studio team also preferred us to make presentations in presentation mode. We chose frames to avoid distracting the audience from other areas in the poster. I think this is an outstanding feature, and it works very well.”* P4, Student

> *“When Miro makes a presentation by dividing frame by frame on its poster, other things outside are not visible; it is good.”* P8, Student

The feature of following the screen of the selected person, which is predominantly used in team project presentations, is among the components used in online juries. By clicking on someone's avatar on the Miro platform, the movement of that person on the screen can be followed. In other words, whatever she/he sees on the screen, the person who clicks on the avatar sees the same screen simultaneously. While the students were presenting their group projects in turn, they mentioned that they could make fluent presentations by clicking on the avatar of the student who had the turn to speak. For example, Participant 4 said:

> *"My favorite feature in Miro is being able to follow someone else while they are presenting. In group projects, one person shares a screen and clicks on the others' avatars when it's their turn. The speaker only shows a point they want to discuss. If only one person were moderating, they would always have to say, 'Can you move the screen over here?', 'A little lower, a little higher.'"* P4, Student

In addition to being used by the students in the group project presentation, the following selected avatar(person) feature is also used by the jury members to follow the student presentations. Members of the jury stated that they use this feature, especially when there is an internet quality problem. While following the student's presentation from the screen sharing, when the internet connection quality of the student or the jury member is low, the images on the shared screen may appear pixel-by-pixel. In these cases, jury members can follow the student's screen by clicking on the student's avatar on the Miro platform. Participant 10 mentioned the experience of using this feature:

> *"The display and sound may not be synchronized, or the screen looks blurry in screen sharing due to an unstable internet connection. Instead of trying to find the individual student's story in Miro, I click on the student's avatar to follow their screen. This is how I follow almost all student presentations."* P10, Juror

Some of the students talked about the ability to add videos on project posters in addition to 2D visuals. They mentioned that they present the project deliverables fluently without changing platforms. However, Participant 7 and his project co-members complained that they could not add the animated gifs they prepared for the product scenario presentation to Miro. Due to this restrictive feature, they changed the platform and made presentations on the Figma platform.

> *"We prepared gifs using the physical model to explain the usage scenarios of the product. But we couldn't add it to Miro. That's why we used Figma. Animated gifs helped us a lot to explain usage scenarios."* P7, Student

Students explain their projects to the jury members during presentation times, which may vary depending on the project development period defined by the instructors. As mentioned in Chapter 2, Literature Review, Frederickson (1990) says that for a product development process that takes one to eight weeks, the presentation could take between ten and twenty minutes.

In all five jury observations, the Miro platform's *time countdown feature* was used for both the jury presentations of the students and for the feedback time of the jury members. The assistant of each class set the countdown according to the scheduled time in Miro. This duration usually varied between 10-20 minutes depending on whether the projects were individual or team. While presenting the project poster in Miro using Zoom's screen-sharing feature, students could see how much time they had left at the counter, in the upper right or lower middle section. In the same way, a feedback timer was set up for the jurors. It was observed that the planned jury times were not delayed, and there was not much difference in the presentation time between the students. For example, Participant 3 and Participant 5 stated that they adjusted their speaking rate accordingly during the presentation.

> *"After joining a few online juries, we discovered that time on Miro can be adjusted. I could see how much time was left at any*

moment. I was able to control myself if I needed to speed up a little bit more or slow down a little bit." P3, Student

"I adjust my speaking rate by looking at the countdown timer. If I need to speed up, I move to the final part of my presentation without mentioning some parts." P5, Student

On the contrary, some students stated that they were not satisfied with the idea of seeing the time countdown during the presentation period. Students stated that this feature caused them to be even more stressed while trying to explain their projects to the jury members.

"There is a countdown constantly warns that time is running out. I think this has a very stressful effect. This feature increases my stress, even more, when I am already stressed." P1, Student

The time countdown feature was used not only for the students to follow but also for the jury members. While the online jury flow continues, when the time set for the student to reach zero, the countdown for the time determined for the jury members to give feedback has started. The jury members stated that this feature was used to allocate equal time to each student and not to delay the scheduled end time on jury day. Participant 10 said he continuously checks the remaining time by taking advantage of this feature.

"We could always see the timer in one corner of the screen, which was advantageous. For example, while sharing my comments as a jury member, I set myself 2 minutes. If I passed 2 minutes, I would thank them and stop talking to let the other jurors talk." P10, Juror

Compared to past face-to-face jury experiences, the jurors believe that the *time management tracking* feature gives each participant more control over their presentations. When Participant 11 and Participant 12 compare face-to-face jury experiences with online jury experiences, they think about time control:

"We also set up timers in physical juries. However, students and I cannot track the remaining time. Only when the time is up, the alarm goes off, and then we know. The presentation is interrupted when the student is making a presentation, and an unexpected alarm goes off. The student may not have anticipated the end of his time." P11, Juror

"We were setting the time and letting everyone see it. Both the student and the juror could plan their speech accordingly. We set a countdown alarm in the physical, but we cannot follow and control ourselves." P12, Juror

After the student completes the project presentation, the next step in the jury flow is to convey the comments and feedback of the jury members to the student. In the previous stage, while the students tried to give the project details to the jury members, they tried to convey their comments about the projects to the students at this stage. As one of the findings of the observational study, jurors benefited from some features of the platforms used by the jury to convey their thoughts. In addition to verbally expressing their comments on the process and solutions for the product development, some jurors supported them with *visual drawings* using the Miro pen tool and Zoom's annotation feature. In this feature, the jury members adjusted the line thickness, color, and opacity of their drawings as they wished. For example, making drawings and sketches on product renders technical drawing details, and physical model images on project posters. Also, they erased drawings with the eraser feature when they wanted to change it or when the other jury member took his/her turn. Participant 7 believes that drawing is more effective for the jurors to give ideas.

"There was a nice feature in the zoom. Jury members were able to draw on the screen. For example, if there is a 3D model, they say, "This section could have been like this." and draw on it. This feature was also present in Miro and was very effective."
P7, Student

In support of this idea, Participant 8 compares this feature with face-to-face juries. He points out that in face-to-face juries, the jury members can give feedback by sketching, but it is not that diverse. And he describes his one jury experience as follows:

> *"I think the feedback was unambiguous in the online jury. In the face-to-face jury, we hang our posters on the board, and the juror can draw with his marker if he wishes. But he can't draw as diverse as here. For example, online, jurors can adjust the pen thickness, color, and shape and create neat drawings with ready-made shapes. In a project presentation, the jury member made an exquisite drawing of the product render in a short time. And it gave me a very creative idea for my project. For the first time, I applied the feedback I received from the final jury to improve the product and added it to my portfolio."* P8, Student

Although most of the students say that they are satisfied with the feedback given by drawing on the screen, the jury members mention this difficulty. Some jury members who tried to draw with the mouse on the computer screen said it was impossible to draw correctly. Participant 9 and Participant 10 express their dissatisfaction with this situation as follows:

> *"Depending on the jury's drawing ability, sometimes meaningless drawings may emerge. But that's not the juror's fault because it's unlikely to draw properly. It is also very relevant to the hand-arm coordination of the juror."* P9, Juror

> *"I never use the annotation feature. Because I can never draw well with the mouse, I try to convey my thoughts verbally. However, I have observed that some jurors use it. It is especially used in form-oriented products of the first class."* P10, Juror

4.2.1.5 Permanence

This main code contains the actions of the jury participants to make the online juries permanent and their thoughts on this subject. As Chapter 2, Literature Review mentions, students, being excited during the jury or failing to take notes while interacting with the jurors may cause the conversations to become inefficient (Anthony, 1991). Six of the eight students from the interview participants said that the ideas of the jury members about the project and the solution proposals they noted for their development were not left in their minds in the face-to-face juries. In some of the online juries, one of the studio instructors recorded the jury day using the feature of Zoom platform. In some, he/she allowed the students to *record their presentations and feedback sessions* from the juries. Comparing this situation with face-to-face juries, the students expressed their satisfaction with the fact that their online jury experience does not fly away; it is permanent. For example, Participant 4 had this to say about their in-person and online jury experiences:

> *"It has rarely happened that I did not record, both in the online jury sessions in the online crit sessions during the project process. It is beneficial to be able to access these records later. For example, if there is a bad comment on my project in the face-to-face jury, I get very distracted and cannot focus on the contributions of other jury members. That's why I hardly remember anything after face-to-face juries."* P4, Student

Participant 1, on the other hand, stated that in addition to recording their jury presentations and feedback, they also took screenshots of their classmates' drawings to inspire their following projects.

> *"I used to take screenshots if I thought the comments on my friends' projects in the online juries would inspire me for my next project. For example, a technical detail drawing drawn by the juror on the screen. I have seen the benefit of this situation in my*

projects. In the physical jury, it may not be pleasant to photograph that I cannot keep it in high quality." P1, Student

Participant 9, one of the members of the jury, agrees with these concerns of the students and says:

"It can be difficult for students to follow the jury members as they speak one after the other. In online juries, students have always asked us to take a recording of the session. And they asked when we will send the recording to them. After a while, we gave them the authority to record via Zoom. I think it was good. They can defend their projects to jurors without having to take notes." P9, Juror

Participant 11, one of the jury members, believes it should be questioned whether the chance of making online juries permanent can also be transferred to physical juries.

"In physical juries, students ask, "Can we record?" We may not take it positively. The real question is, can we transfer the ability to make online juries permanent, which students find advantageous in online juries, to physical juries." P11, Juror

Since the time is limited for each student, it was observed that some jury members did not have time to speak. As a solution, the jurors sent their comments in short, 1-2 paragraphs, to the chat section in the Zoom platform. By sending feedback to students via chat, students were able to receive feedback not only from limited jurors but also from every jury member who wanted to share their ideas for the development of the student and the project. *Written feedback from the chat section* made it permanent for the presenter and other students. After the presentations, students gave their defenses in writing via chat to the comments of the jury members. However, it has not been observed that an active dialog is maintained over the chat. Although

some of the students interpret it as an advantage, some think this feature is problematic. For example, Participant 7 said:

> *"It was effective in online juries that the jury members wrote in the chat section. At least, if a juror is going to give an important idea, she/he can contribute to the project, even if the time is not enough for her/him to speak. Since this feature was unavailable in the face-to-face jury, the juror could comment efficiently since the time was insufficient."* P7, Student

Participant 2 and Participant 5 believe that written feedback is problematic. They complain about the lack of mutual dialogue.

> *"I usually do not understand the opinions and suggestions of the jurors in written format. It isn't easy to express oneself in writing. Even if I respond to the juror's written comment after my juror's turn has passed, it will remain unanswered because the juror is watching the next person's presentation. There is no mutual dialogue."* P2, Student

> *"I generally cannot read what is written in the chat section in my jury presentation. At that very time, I'm talking to the other juror. I cannot reply to the teacher who sent a written opinion. It is not very efficient for me."* P5, Student

4.2.1.6 Technical Problems

This code includes the technical problems encountered by jury participants, consisting of students and jury members, during online jury sessions. During the observations, some participants encountered technical problems. Since the cause of some of these problems was unknown at that time, how to develop solutions and what to do were also not known. Some of the technical issues are: the speaker

suddenly freezes, the student can't find the video they added to the Miro board while they are presenting, and the attendees are disconnected. In addition, at least one participant in almost all the observed juries stated that they had internet connection problems. Also, 10 out of 13 participants stated that they had difficulties due to poor internet quality in at least one of their jury experiences. While making presentations, students said that when their internet quality is low, the platforms they use start to work slowly, and sometimes, the platform suddenly shuts down. The members of the jury, who wanted to follow the project presentation of the student with poor internet quality, said they had difficulty because they could not see the images clearly in the screen sharing. In addition, jury members may miss the student presentation due to sudden disconnection from the internet. Participant 8, as a student, and Participant 10, as a jury member, shared their experiences of encountering technical problems in the online jury.

> *"I have just finished my speech and presentation. I disconnected from a video conference all of a sudden. I don't know why and how it happened. After a while, I reconnected to the jury session, but the next student presentation was on. I couldn't hear the opinions of the Jury members about my project. I only present nothing more."* P8, Student

> *"For example, in a presentation, when the internet quality of the student was poor, interruptions and freezes occurred on the screen. The text and images on the screen share were invisible. In addition, the student's voice and the images in the screen sharing were not playing simultaneously. It was challenging for me to understand and follow the project."* P10, Juror

Jury members from the Interview participants point out the lack of equality of opportunity among students when they think from an educator's perspective. They state that platform and tool accessibility and usability may be low due to the physical

environment, technology accessibility, and device quality. For example, Participant 11 thinks:

> *"Actually, technical problems are a serious disadvantage for the student. These situations increase the stress and anxiety levels of the student. Therefore, the student who encounters technical problems in online juries cannot have equal opportunities with others at that moment."* P11, Juror

Participant 6 believes talent is needed to continue jury presentation after encountering a technical problem.

> *"For example, the screen suddenly froze. At that moment, we need to have crisis management skills. The time allotted to us is certain, and it is necessary to remain calm to make the best use of that time. This is not very possible."* P6, Student

Jury members and students who encounter technical problems unexpectedly find it challenging to continue the online jury session without interruption. As Participant 1 stated, noticing the reason for these problems and bringing instant and quick solutions is impossible.

> *"We cannot find a solution at that moment because we don't know what causes it and how to fix it. I usually wait and try to tolerate it a bit."* P1, Student

4.2.2 Deliverables

The second theme and the codes in it come from the findings and analysis of the observational study. Considering the observation notes, there were interview questions about the jury deliverables to gain in-depth insight.

The deliverables include project videos, project posters, and physical models. They are prepared by the student to convey the final product details to the jury members

and evaluated by the jury members to grade. Since their approaches to the deliverables are different, there are both similar and different findings according to students and jury members. Figure 4.2 illustrates the code groups under the main theme of *Deliverables*.

Figure 4.2. The code groups of Deliverables.

4.2.2.1 Project Videos

It was observed that the most of the students prepared videos which were among the mandatory expectations in some jury briefs. Project videos were watched by all jury participants using screen sharing, usually, before the student started the project poster presentation. This video included the project's development process, final product details, and usage scenarios. While some students prepared animations on digital platforms that describe 3D model details and human interaction, some took a scenario video edited with a physical model in their environment. Students think that learning new digital platforms and tools and improving themselves in their use have a significant impact on their academic life. Most of the students and jury members believe that the videos are very effective for understanding the project idea and details. Participant 10's thoughts on this issue are as follows:

> *"There is a great difference between a student who prepares a video and a student who does not. The student's presentation becomes stronger with the video, and the project idea becomes more understandable. In fact, some students' impressive videos are more memorable than their project ideas."* P10, Juror

In addition to jurors watching student presentations to evaluate, students also watch their classmate's jury presentations. Participant 1, as a viewer, thinks that explaining the projects with videos is more memorable.

> *"The project you watch with a short video becomes more memorable. I remember more clearly when I watched videos in my friends' projects, and I could forget what I followed on the poster."* P1, Student

The participants said that the increasing prevalence of video preparation with online juries helped students explain their projects and allowed the jury members to understand and evaluate the details. After the pandemic, the juries of some classes began to be made physically. Participant 9 said that they continue to maintain video usage, which they take advantage of in online juries and physical juries. Unlike online juries, physical juries faced the problem of not being able to follow due to sitting far from the tool where the video was played.

> *"Online jury experiences have an impact on physical juries. For example, there was a project video among the project brief requirements in the physical jury the last term. Even if there is no poster presentation, I can understand it very well from the video. While the students were making presentations in the same seating arrangement as our physical jury, they also had the juries watch the videos. However, I had difficulty seeing the video due to the seating arrangement. I missed some details."* P9, Juror

Although students also expressed their satisfaction with the impressiveness of the videos in presenting their projects better, some students complained about the increased workload. Students had to prepare many 2D and 3D digital and physical deliverables for a product presentation. For example, Participant 2 mentioned:

> *"The videos help jurors understand; it's true. It is now mandatory for us to prepare videos. But they also need to*

consider how much workload is on us. In that way project involves creating 3D models and 2D illustrations, preparing physical models, videos, etc. It is very exhausting for me." P2, Student

4.2.2.2 Project Posters

It was noticed that in the observations, the project poster presentation differs in some respects compared to the physical jury. The jury members and students faced different experiences in the online industrial design juries. As in face-to-face juries, students prepared posters in the sizes determined by the instructors, describing their final products and details. In face-to-face juries, students would usually print out large-sized posters and present in front of it. They usually pointed to the place they specifically describe, and when the juries want to examine a detail, they get up from their seats and take a closer look at the poster. Unlike this experience, the student who shares the screen in online juries allows only that part to be seen on the full screen of the participants, especially by getting closer to the place he/she is talking about. As mentioned under Tools and Platforms, students and jurors believe that posters for online juries are more elaborate. They say this is because the jury members were examining the posters very closely from their screens. Participant 3 believes keeping up with this new experience improves her.

"I was spending a lot of time preparing posters. It has to be almost perfect because all the mistakes are noticeable when zooming in. But after preparing a careful and high-quality poster in this way a few times, it has become a habit for me now. Compared to the past, I can say that my posters are much more impressive." P3, Student

In addition, it is thought that the importance of poster presentation has increased since it is impossible to interact with the physical model in online juries. In particular,

since the jury members could not experience the product and human interaction, the students tried to explain the usage scenarios of their products and their interaction with people with two-dimensional drawings. To describe a three-dimensional experience in a two-dimensional drawing, they prepared designs showing the use of the product from different angles. Participant 8 talks about his own experience:

> *"I try to make the poster visually strong. I draw six different scenario frames and show my product from different angles in each frame. So that what the product is, how it is used, how it interacts with people can be understood."* P8, Student

They state that the visual quality is naturally higher in online presentations when compared to the face-to-face jury experience, where hardcopy printouts are made. Participant 6 expresses her thoughts on this matter as follows:

> *"When the poster is examined on a physical printout, the print quality is not high even though I have made the visual quality high. Color tones become different, faded, etc. That's why I think it's difficult to present with a hardcopy poster."* P6, Student

Students who believe that visual quality decreases when a poster is printed for face-to-face juries mentioned that it is very costly to get high-quality printouts. Some students complained that the stationery and printing costs were too high. Some students stated that they are glad they do not pay this fee in the online juries and are happy that they are not wasting paper in the final juries due to environmental concerns. They believe the environment is harmed by thinking that each student prints out one or several large-size printouts in the juries. For example, Participant 1 said:

> *"When I printed out my posters for our physical jury, it cost so much. It doesn't seem right to me that it is mandatory to pay this fee. On the other hand, when students print out their posters in*

every project, we harm the environment so much paper waste. Trees are cut down because of that." P1, Student

4.2.2.3 Physical Models

It has been observed that the physical model presentation, which is also included in the literature review and is one of the fundamentals of the industrial design jury, encounters ambiguous situations in online juries. Physical models are one of the requirements of industrial design juries in the METU department of Industrial Design. In the product idea development process, students made physical models from different materials and developed the project details with their contributions. On the other hand, the jurors could understand the product details and interaction of the students with the help of the physical model and explain their feedback on the physical product. Almost all participants think the physical model experience for industrial design juries is precious for students and jury members. The lack of this experience in online juries causes many problems.

It can be said that the presentation of physical models, which are among the online jury requirements, is problematic. Participants mentioned that information and comments should be transferred from the student to the jury members and from the jury members to the student about the product in the jury. However, without a physical model, the students had difficulty conveying their product solutions and details to the jury members. The jury members also had problems understanding and evaluating the project, as they could not interact with the physical models of the products by seeing or touching them. The opinions of Participant 6 from the students and Participant 12 from the jury are as follows.

"Sometimes, I want to show the physical model I have to the jury members and explain what a good design solution is. "Look how easily you can carry it, how ergonomic it is, how the combination details worked." I want to say." P6, Student

"Not being able to touch physical models is one of the biggest shortcomings of online juries. The physical model is vital for the student's development and the jury's evaluation. It is much easier to understand, demonstrate and give feedback through the physical model." P12, Juror

The students developed some solutions to eliminate the lack of feedback sessions over the physical model. In the observations, all students took photos of the physical model from multiple angles and uploaded them to their project posters, and some students took 360-degree videos of their physical models. The students said in the interviews that the purpose of these solutions is to help the jurors make 3D imaginations of that very model, evaluate the product and give effective feedback. However, they have experienced that the shooting angle, light quality, and photo quality affect understanding 3D models in 2D images correctly. Participant 3 believes this experience made it difficult for the jurors to understand and caused confusion.

"Normally, when jurors pick up the model, they examine it and understand what it is. But in online juries, if I take the photo from above, the product looks small; if I take it from below, it looks big. The inconsistencies in the photos confuse the jurors." P3, Student

In addition, since the students participated in the jury session with their cameras open, they tried to explain the physical models to the jury members by bringing them closer to the computer camera. However, the jurors and the students do not think this solution is successful.

"When the 3D model is displayed in photographs and on camera, it is seen as two-dimensional by the jurors. I can decide what to show and what to hide from the computer camera. The juror doesn't notice." P4, Student

"What you spend a long time doing shrinks into two dimensions. If you open it at Miro, the quality deteriorates and can become something no one cares about." P1, Student

Participant 9, one of the jury members, talked about the difficulty of evaluating project ideas with the help of physical products in online juries and that some students tried to deceive the jury members by seeing this as an opportunity.

"Some students cheat on this. For example, they make edits in Photoshop after taking a photo of the physical model. They change product ratios, add/remove details, etc." P9, Juror

After the problems mentioned earlier with the physical model were experienced in online juries, students and instructors stated that the importance of the physical model reduced naturally. Participant 1 said that making detailed physical models is not essential for online juries.

"I made the model very detailed and accurate for the physical juries. However, this is not so important in the online jury. The jurors can't see it anyway. I also made incomplete physical models with little detail without paying much attention." P1, Student

4.2.3 Communication & Interaction

The third theme includes how communication and interaction between participants are ensured in online juries. Students and jurors who communicated face-to-face in physical juries did not have this experience in online juries. In jury sessions, there is an interaction between student-student, student-juror, and juror-juror. Communication and interaction, which is also mentioned as the missing part of online interviews in the literature review, almost all the research participants touched on this deficiency in many respects. Figure 4.3 illustrates the code groups under the main theme of *Communication and interaction.*

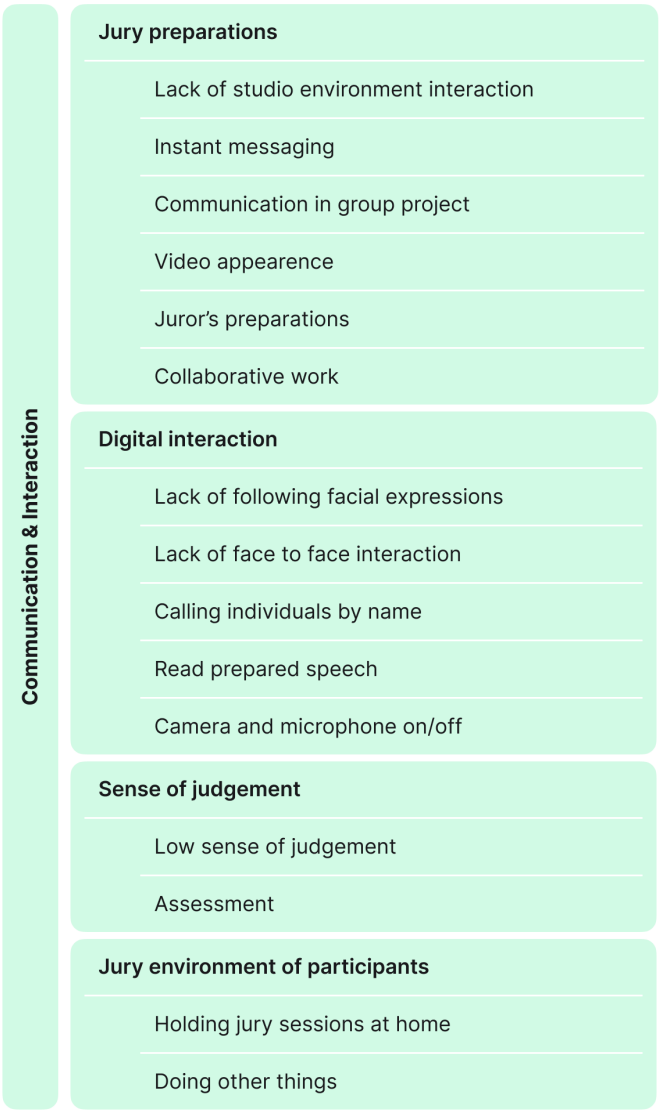


Figure 4.3. The code groups of Communication & Interaction.

4.2.3.1 Jury Preparations

This code group contains the findings about the communication and interaction of students and jury members in preparation for the jury session. Students said they were primarily prepared for physical juries in an industrial design studio. In online juries, all students prepare for jury sessions in different environments. They talked

about the problems and deficiencies caused by being away from their classmates during preparation.

We can divide the students' findings of developing their projects before the jury presentation and preparing their jury deliverables into two group projects and individual project findings. In the group project, students preferred tools and platforms where they could work collaboratively. They were working simultaneously on the platform where they could share the same video or audio at the time they determined.

> *"We used to use Illustrator at first, but now we use platforms like Miro and Figma Jam. We can all work at the same time."* P6, Student

Students said that the project idea development and jury requirements preparation phases progressed very slowly because they *could not communicate face-to-face with their group members*. Even if they set up regular meetings on video conferencing platforms, some students turned off their cameras/microphones, didn't even participate in the preparation process, and didn't even state an opinion. This problem in communication and interaction negatively affected the idea development process. Participant 7 said:

> *"A group of friends of mine always turns off their camera at meetings and never speaks. He attends the interview from his room bed and may even be asleep. How are we going to do a group project in this case? Or other students are doing a different job from their computers during the meeting, and they do not communicate. It is challenging to create and develop a project idea."* P7, Student

However, since not every platform is suitable for collaborative work, jury requirements have been distributed within the team. Situations such as a student's lack of technical equipment or poor internet quality were crucial when assigning

tasks. For example, a 3D modeling task was not given to a student with low computer performance. Students who could not come together physically during the pandemic could not work together in constructing physical models. For this reason, the physical model task was completed by a single student. Students complain about the unequal distribution of tasks due to situations like these examples. Participant 2 and Participant 7 talks about their experience in group project preparation:

> *"One of my teammates had an ancient computer and could not do 3d modeling. If we had worked side by side, we could have prepared it together, but since we were far away, I ended up with a huge task. He just edited the text, dimensions, alignments, etc., on the project poster. This is not fair at all."* P2, Student

> *"Requirements such as 3d modeling and physical model making in online jury preparation are very difficult with group members. We had a task distribution in one of our projects, and I saw the physical model the day before jury day. I could not contribute at all. Because we are in a different place, I cannot help the person doing it in front of the computer."* P7, Student

Students believe that the online preparation experience is problematic compared to the experience of preparing for the jury in a studio environment. Almost all students said less communication and interaction with group members and classmates negatively affected the jury preparation. While developing the projects and preparing the deliverables in the studio environment, a peer learning environment was created. Students gave feedback and motivation to support each other. Participant 4 talks about his jury preparation experience at the studio:

> *"We always worked in the studio with my friends. Sometimes we even slept there for days. While developing my project idea, I would get ideas from my classmates when there was a blocking situation. Everyone was helping each other, whether it was their*

close friend or anyone else in the studio. We were experimenting with physical products and giving each other feedback." P4, Student

Due to *the lack of physical interaction in the online environment*, students had difficulties in the absence of peer learning and peer feedback. Some students have developed new solutions to maintain studio interaction. While preparing for the online juries, they held meetings for long hours on video conference platforms. Although each student was preparing for their project in these meetings, they helped each other by establishing instant interaction.

"We were working together for hours in online meetings. We were listening to music and chatted. Everyone was doing their project, but we constantly asked each other questions. Thanks to the instant feedback I received from my friends, I developed my project quickly." P7, Student

Participant 13, one of the jury members, emphasized the importance of the studio environment in industrial design. She says *the lack of social learning* negatively affects the quality of industrial design education.

"Design is a form of social learning. In industrial design, the studio has a vital place. The fact that students do not work with their classmates, do not learn from each other, or that the studio instructors cannot observe the processes reduces the quality of education." P13, Juror

In addition, it was observed that some jury participants had the motivation to make preparations for the jury sessions, while some did not. For instance, instead of sharing their environment with video camera, they added different visuals for changing the background in the camera appearance, which is one of the Zoom platform's features. Some of these were the environment images of the METU campus where they were away during the pandemic, the render images of their

projects, or the similar images that they determined as group members in the group project. Also, some participants who connected with the video camera did not pay extra attention to the jury presentations regarding dress and appearance. In face-to-face juries, some students preferred to dress formally and show more care than usual for jury presentations. However, this kind of care was not seen in the online juries, and some students may even be participating in their pajamas.

4.2.3.2 Digital Interaction

This code group indicates that the interaction between the jury participants is digital in online juries. Alnusairat et al. (2020) proved in their studies that students were not satisfied with the interaction in online juries. They said that the main reason for this was that the students *could not see the facial expressions* of the jury members and they might lack an emotional connection.

Students and jury members said that their physical distance caused *the lack of emotional bond* between them. In the study, most of the students, about 70%, preferred face-to-face communication because they had difficulty communicating with the instructors (Alnusairat et al. 2020).

> *"It is awful not to be physically in the same place and not have warm communication. I prefer to be able to communicate without the disruptions of online."* P4, Student

Jury members also stated that they could not feel the excitement and jury atmosphere of the students because they were not in the same environment as the students. Participant 11 called the communication in the online juries "mechanical communication" because it could not see the students' excitement and support.

> *"I feel how excited the students are when they are together, because of their behavior and energy, and I get excited with it. But I cannot establish a warm bond with the students in the*

online juries to support them. There is mechanical communication." P11, Juror

In the online juries conducted through the Zoom platform, the size of the video image frames of the jury participants was reduced when the presenter shared his screen. The students said that while they were making presentations, they looked at the project posters and did not look at the jury members. During the presentation, they felt that they were presented in an empty room since they could not receive any audio or visual feedback from the audience. Participant 5 stated that he had no foresight about what the jury members were listening to or what they were thinking while making a presentation. Participant 8, on the other hand, said that although he *could not make eye contact*, followed the jury members through camera view to strengthen the feeling of interaction.

"There is no interactive interaction. I only see the screen with the project poster. I don't know if the teachers are listening or not. I can't predict whether they have positive or negative thoughts. This is making me nervous." P5, Student

"I try to look at the camera view of the jurors while presenting, to at least see the audience's face and nod that they're listening. Even though I don't know where they're looking, even though I can't make eye contact." P8, Student

When Participant 11, one of the members of the jury, as an educator, emphasized the importance of interacting with students face-to-face. She believes that not knowing the students and seeing their progress will harm the quality of education.

"Seeing and getting to know the students face to face is a very different and nice feeling. For us educators, this is very meaningful. In online, however, we do not know them, we do not know their level of knowledge, and we do not understand in what

ways we should contribute to them. This reduces the quality of education." P11, Juror

Considering the interplay between the juror and the juror, Participant 12 highlighted the difference between the physical jury environment and the online jury. He said that communication between jurors in online juries was also low.

"When we were on the break in the physical jury, we would be in touch as the members of the jury. We used to exchange ideas among ourselves about the students presenting. This communication is completely over in online juries. I think it's a major shortcoming." P12, Juror

Regardless of the year of the students, it has been observed that many students *read the jury speech from a text* that they prepared before. In the jury presentations, which lasted approximately 10-20 minutes, it was understood from both the video camera and the tone of voice that the students read the speeches directly. In the project presentations made by reading prose, it was noticed that the jury had difficulty paying attention and understanding the details. Also, all of the students in the interviews said that they read the speech they had prepared beforehand in the jury presentations. While the students think that reading the ready-made text makes them feel comfortable, the jury members believe that this communication is not natural. He says that it is clear from the tone of voice, emphasis, and speed of speech that the students have read the ready-made plain text. Due to this situation, they had difficulty following the presentation and focusing.

"It was very inefficient for them to read pages of plain text directly. I find it difficult to listen to students presenting monotonously without emphasis. I can't focus." P10, Juror

Although *calling individuals by name* code is not in all jury observations, it was included in the researcher's observational study notes and the coding phase. Whether they were guests or the studio team, the jury members called the students by their

names. On the Zoom platform, the "username" determined by that participant is written in the middle or bottom left of each participant's frame. It has been noticed that it usually is the names and surnames of the students. Although the guest jurors saw the students for the first time, they called them by name while asking questions or giving feedback.

4.2.3.3 Sense of Judgement

In Chapter 2 Literature Review, it was mentioned that the design jury seating arrangement and function were hierarchical. In physical juries, the experience of jurors sitting side by side in chairs and students presenting standing in front of them does not exist in online juries. Students and jury members interpreted the deterioration of the hierarchical perception in traditional juries as the disruption of the jury atmosphere. Participant 4 and Participant 12 mentioned that:

> *"When I'm presenting in the studio, the jury members are lined up in front of me, looking at me. There are cookies and coffee on the tables in front of them. This makes me feel that they are different and superior to me and that they will judge me. But in the online juries, the video frame of all participants in the video conference is the same size, no one is different from each other. The hierarchy is not evident."* P4, Student

> *"As the difference and hierarchy between the jury members and the student are not felt, the atmosphere of the jury is not noticed."* P12, Juror

Anthony (1987) observed in the design juries, students had behaviors such as hiding their lips, chewing nails, tapping their feet, etc. due to stress. Students who made presentations in online juries stated that they were very comfortable as they *did not feel themselves being evaluated and judged*. They said that this helped them to be less stressed and to complete the jury presentations more easily.

"We students do not feel the spotlight on us in online juries. This allows us to present more confidently. I don't see the eyes looking at me when I'm presenting. I am very comfortable as if I was alone." P6, Student

Although the students interpreted this new experience positively, the jury members emphasized the importance of preserving the traditional design jury tradition. They also emphasized that while the students were making presentations in online juries, their public speaking skills could not develop, and their presentation skills had a valuable place in design education. Participant 11 believes that having presentation skills will positively affect the professional life of the student.

"Acquiring public speaking skills is very important for design students. This skill is challenging to acquire when presenting to an online jury. It will positively affect not only their education but also their professional lives." P11, Juror

4.2.3.4 Jury Environment of Participants

Students and jurors were connected to the jury sessions from their home environment. The experiences of all participants differed depending on the environment and conditions they were in. The participants said they are trying to cope with the challenges arising from *the home environment*. For example, other people in the house entering the room and talking loudly, unexpected movements reflected in the camera image of pets, knocking on the door, and the arrival of cargo. Participants who experienced situations like these said they panicked to eliminate these problems and felt embarrassed towards other participants. Other participants stated that they lost their attention when they saw that they faced a problem, as in the examples, and they had difficulty focusing on the jury session.

"Someone's dog barks, juror's babies may cry sometimes. This happens because we are at home. However, now we take it for granted; it can happen to any of us." P5, Student

Participants took precautions to reduce the challenges of attending the jury session from home, for example, warning people in the house to be quiet, such as locking the door of the room. On the other hand, some participants said they did not attend the final juries from home. They prefer places such as the library or a quiet cafe. Participant 12 explained her solution as follows:

"I did not prefer to be at home for the final jury because I would have to take care of my daughter or son and miss the jury presentation. So, I go to a quiet cafe or library." P12, Juror

During the online jury sessions, the cameras and microphones of the jurors were mainly on. On the other hand, the students said they were interested in different tasks at home by turning off their cameras and microphone before or after their presentation. Although some students mentioned this situation as an advantage, some interpreted it as a disadvantage. For example, students said they were doing housework, eating, or resting in bed while their cameras were off. With this flexibility, they could follow their friend's presentation while dealing with other tasks. As an example of the opposite view, students said that with distractions in the home environment, they could not focus on listening to their classmates. Participant 7 and Participant 4 exemplify these two different views.

"One of the advantages of online juries is to listen to the presentations and feedback from the jury while dealing with other works. While doing other things on physical juries, I almost missed all my friends' presentations. For example, going out to the garden, the canteen, chatting with a friend, etc." P7, Student

"There can be distracting factors at home depending on environmental factors. I cannot focus. Sometimes I try to follow the presentations while lying in bed but fall asleep." P4, Student

4.2.4 Covid-19

Higher education institutions have been obliged to move their instruction online due to the Covid-19 epidemic and its related countermeasures (Iranmanesh & Onur, 2021). Due to the fast transition to online education, industrial design juries were held online in the METU Department of Industrial Design during the pandemic. Many participants had no online jury experience before the pandemic. Students and jury members state that there has been a rapid transition to online juries due to the pandemic, but they have faced positive and negative experiences in this process. In this section, the opinions of the interview participants about this process will be discussed. Figure 4.4 illustrates the code groups under the main theme of *Covid-19*.

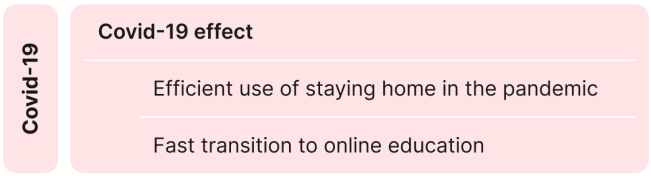


Figure 4.4. The code groups of Covid-19.

4.2.4.1 Covid-19 Effect

Along with online education, students have different opinions about the online conduct of industrial design juries. Most students believe this *rapid transition is easy* because they mentioned their high ability to use digital tools and learn. Some students stated they had difficulties transitioning to online juries and learning new platforms. The opposite views of Participant 5 and Participant 8 are as follows.

"Our generation is very familiar with learning new programs and using them professionally in a short time. That is why I did not have much trouble joining the juries online and making presentations on online platforms." P5, Student

"I had a more challenging time transitioning to online education than I have ever had before in my life. My mental health was severely affected. I was good at drawing the product by hand, which is a traditional method. In the online juries, everyone in the classroom prepared posters using many different platforms. That is why I could not do hand drawing because the jury's expectations started to be like this. I had a hard time working with new platforms." P8, Student

Participant 9, one of the jury members, also mentioned that it is not easy for students and jury members to try to conduct an online jury using new platforms. He said this might be due to a lack of technical knowledge and difficulty reaching the proper device.

"We faced many problems because not everyone had the technical knowledge, computer knowledge, or even computer accessibility. Especially the jurors. At first, the development of technical knowledge was not easy." P9, Juror

As Rashid mentioned that during the pandemic, many students and their families are coping with Covid-19, and many more are suffering from the effects of this crisis (2020). Students, who have almost no social life due to pandemic restrictions, stated that they always pay attention to staying at home to reduce the risk of infecting their families with viruses. 5 out of 8 students said they are bored of spending too much time at home and try to *use their time efficiently*. Referring to the increase in online education opportunities during the pandemic, students have completed courses they can attend from home in many different subjects. For this purpose, while some students took online training to learn about the platform, they are new to, some

students tried to buy new technological devices and gain new skills. Participants 2, 4, and 7 expressed the following about gaining new abilities during the pandemic.

> *"Since we were always at home during the pandemic, we naturally spent less money. Most of my classmates bought tablets, monitors, etc., with this money. We have improved ourselves in 3d modeling, shading, rendering, and many other subjects. The hand drawing gradually disappeared."* P2, Student

> *"I normally went out every day, but in the pandemic, I could not leave the house so as not to risk my family. Because I had too much free time at home, I always investigated how I could improve myself and spend my time with quality. My classmates took online courses and learned many programs, such as Blender, Photoshop, and Unity. Especially since we shared free courses, I watched online courses while lying on the sofa."* P4, Student

> *"I felt empty and unproductive during the pandemic since I was not occupied with something. I was bored. That is why I have always practiced in Fusion and Blender programs. I think I have improved myself a lot in 3D modeling."* P7, Student

It can be said that learning new platforms and tools during the online education period has given students new abilities. Stating that they have talents in different fields, the students think these talents also impact online juries. As they become experts in subjects such as Photoshop and Illustrator, their 2d drawing quality has increased. They have modeled the project idea in their mind more accurately by practicing 3D models on platforms such as Fusion and Blender. They have been able to explain the project details to the jury members with high-quality videos by learning programs such as After Effects and Unity. For example, Participant 2 describes the experience he noticed in online juries:

"Learning to use new platforms with online courses, our ability to evaluate and practice since we have much free time at home, started to be noticed in the juries after a while. Thanks to these, the quality of our project poster has increased a lot. Especially in terms of visual quality, 3d modeling, and scenario drawings. This allowed us to make more impressive presentations and posters."

P2, Student

Students and jury members conducted online juries during the pandemic, which they had rarely experienced. They faced some advantages and some limitations of being online for the juries. While looking for solutions to restrictive parties, they also evaluated the impact of their advantages on the traditional jury experience. They believe that the effects of online jury experiences will continue, even if most of the jury members and the participants switch to physical juries during the post-pandemic normalization period. Participant 12 believes that transferring some of the experiences that contribute to improving the traditional jury experience from the online to the physical environment should be evaluated.

"Rather than going back directly to previous experience, if we combine the advantages we see in online juries with the advantages in face-to-face juries, we can improve the jury experience for students and jury members. It may not be possible to transfer every advantage because the possibilities may not be available. However, at least one part of the advantage must be maintained. For example, being able to give verbal and written feedback to projects." P12, Juror

4.3 Discussion

The thesis research aims to examine online industrial design jury experiences deeply and answer research questions accordingly. First, online industrial design jury

observations were done by aiming to learn students' and jury members' experiences and answer the question "what is happening?". Second, with the support of the observations, interviews were done with both students and jurors to gain deep insights about their experiences and answer the question "why is it happening?".

Both observation and interview findings, which form the basis of the answers to the research questions, are explained in the previous section with researcher notes and participant citations. In this section, the key findings of the research are discussed with the contributions of the researcher. The researcher's contribution to discussing the research findings is considered to be efficient, as the researcher herself is from an industrial design education and participates in both face-to-face and online juries as a student. The main findings of the thesis research are discussed under 4 themes in this section.

- Tools & Platforms
- Deliverables
- Communication & Interaction
- Covid-19

4.3.1 Tools & Platforms

Industrial design juries are completed in a flow that starts with student presentations and ends with a jury and student dialogues about jurors' feedback on the project. For decades, juries have traditionally been held face-to-face, in a physical setting, as mentioned in Chapter 2. However, during the Covid-19 pandemic period, online juries were held on digital tools and platforms. Ceylan et al. (2020) stated in their research that there is not a big difference in terms of flow between face-to-face juries and online juries. It can be said that the tools and platforms used in online juries have a significant impact on the continuation of face-to-face jury flow. The specific features of the tools and platforms chosen for online juries can be challenging at times while meeting the many needs of the jury participants.

One of the essential features of conducting the juries online is the invitation of guest participants without having them travel. It would not be wrong to say that the participation of experts from different cities, countries, and even disciplines as jury members will contribute to the development of industrial design students. If the freedom of each participant is to be included in the jury without the constraints of time and space used, it can help increase the quality of education.

Online juries start with screen sharing to convey the student's final project idea and product details. Jury participants follow the student's presentation from the screen of the person who shared it. It can be said that the authority on what the audience will see during the presentation is the student who shares the screen since jury members have the power to follow when, where, and in what detail and order can be interpreted as advantageous for the students to control the presentation flow. In addition, it is possible to examine every detail of the project poster by zooming in on online juries. Besides the students zooming in on the details they prefer to control in the screen-sharing image, the jury members may also need to examine themselves. In face-to-face juries, jurors could look at their preferred places on the poster in front of them. It can be said that there is a need for this experience to continue in online juries. For this reason, the Miro link with the project posters was sent to the jury members. They examined the details they wanted without depending on the student's screen sharing, such as technical drawing, connection detail, and product rendering. Similar to the face-to-face jury, the different side of this experience can be said that the jury members who examine the digital poster can see the product details very closely with zoom-in. Due to the seating arrangement in face-to-face juries, the project poster could be far away, and it was more difficult for the jury members to catch the details. Although this situation is challenging for industrial design students, it can be said that at the end of the day, it helps them to prepare high-visual quality posters with data detail and near perfection.

Students used many features of the platforms during the presentation. The presentation mode, following someone's cursor and time counter, can be counted

among them. Monitoring the time remaining during the jury with the time counter on the screen is effective not only for the students to adjust their presentation time and flow but also for the jury members. It can be said that this feature helps the jury participants to be in control of the jury and to use the time efficiently.

After the students have completed the project process and the final product presentation, it is time for the jury members to share their appreciation and suggestions for the project's development process. In jury sessions, which can be considered a dialogue between students and jury members, the speaker must convey what he wants to say. The jury members used some features of the tools and platforms while giving feedback. They conveyed the feedback verbally and visually by drawing on the project posters with the pen tool in Miro and annotation features in Zoom. With the platforms' drawing features, they could give visual feedback on the thickness, color, and shape they wanted. The fact that it is impossible to draw appropriately with the mouse can cause this feature to be confusing for students rather than easy to understand.

Giving students visual feedback by drawing on the project posters and written feedback with the chat and comment features of the platforms can help the jury sessions to have a lasting effect. The students stated that they could not remember what was said on the jury because they were very excited and forgot after the jury. It can support the jury's contribution to their development by watching the jury sessions recorded in online juries afterward. These features help jurors to be a kind of learning and development session for students, not just the final product presentation session.

While the tools and platforms have supportive features for online jury flow, they can also make online juries more challenging. Both students and jurors may encounter expected and unexpected technical problems during the jury session. Technical problems can cause the flow of the jury to slow down or even stop. There may be difficulties in the jury session due to the slow operation of the platforms, low internet quality, and technical limitations. It will be challenging for students who stated that

they are very excited and stressed in their jury presentations to be calm in the face of these problems. In the face of technical problems, students can be expected to be skilled in crisis management. However, this may cause the jury session, interpreted as challenging enough for students, to become even more challenging.

4.3.2 Deliverables

Students prepare some deliverables to present the project ideas they have created within a particular time to the jury members. These deliverables, usually among the jury requirements, include a project video, a project poster, and a physical model. Jury members review deliverables to evaluate students and grade projects. For this reason, it can be said that the approach of students and jury members to deliverables is different.

The importance and balance of jury deliverables in online juries differ from face-to-face juries. While video and posters are in the foreground in online juries, it can be said that the physical model remains in the background. Among the reasons for this situation are the inability of jury members to interact with the physical model, which is a three-dimensional deliverable, shown in 2D from the camera views of students. Although the lack of video and poster presentation is tried to be eliminated, it can be said that the absence of physical model interaction, an essential part of industrial design juries, is a significant loss.

The importance of video and poster presentations seems to have increased due to high-quality viewing on digital screens, capturing details by zooming in, and the physical presentation being in the background. Compared to the face-to-face jury experience, poster presentation and evaluation experiences differ. In face-to-face juries, the jury members can see the posters as a whole and examine the details afterward, while in online juries, they examine the details by zooming in. While mastering the details helps the project's intelligibility, it may be lacking in seeing the whole. As the participant students stated, since digital poster presentation is at the

forefront, they started to prepare very high visual quality and impressive posters using different tools and platforms. Likewise, they prepared high-quality videos by using the features of the tools and platforms. It can be said that the videos showing the user's interaction with the product and the project construction process help the jury members to evaluate the project and give feedback. In addition, placing physical model images and videos on project posters can help jury members visualize physical models. However, it is possible to students to deceive the jury members. Photographing angles, ambient light, and even visual photoshop may cause students to deceive the jurors.

According to Bender and Vredevoogd (2006), online juries ensure that all participants are seen to display materials the same way, as opposed to having a front-seat advantage in the classroom. We can say that seeing the videos and posters in the same detail and high quality by all jury members and students helps to follow up the project presentations. However, it can be said that viewing all deliverables on the screen in 2D, including the physical model, is restrictive for online juries.

4.3.3 Communication & Interaction

The importance of mutual communication and interaction between students and jury members in the design jury experience cannot be underestimated. In online juries, this communication and interaction are provided digitally instead of face-to-face. Instead of interacting face-to-face in the same physical environment, each individual is involved in a different environment in online juries. Due to the different environmental conditions of all students and jury members, there may be problems in communication and interaction during the jury experience. Almost all participants emphasized that the most problematic aspect of online industrial design juries is poor interpersonal communication and interaction. During the observations, it was noticed, the fact that many students' cameras and microphones were turned off during the jury sessions weakened mutual communication and interaction. This situation

can lead to a decrease in the efficiency of the jury experience during the preparation for the jury session, student presentation, and jury feedback.

The students stated that they prepared for the face-to-face juries, mainly in the studio environment with their classmates. However, due to the pandemic, they prepared for online juries separately from their classmates. The inability of group members to work together and the low level of peer learning can negatively affect the quality and efficiency of industrial design juries. Students benefited from the features of online tools and platforms to meet these needs. They used collaboration tools to work synchronously with group members and video conferencing tools to transfer the face-to-face working environment online. However, as stated by the participants of this thesis research, these solutions are insufficient to meet the need for interaction in the preparation phase.

The environment and seating arrangement in the juries cause the jury members to be offensive and the students to be defensive (Boyer & Mitgang, 1996). Traditional jury experience differs from online juries in these respects. Unlike face-to-face juries, in online juries that take place in video conference tools, it is challenging to notice the hierarchy between students and jury members. Since students as presenters and jury members as audiences follow the project deliverables from the screen sharing, the video camera views of the other participants may remain in the background. In physical juries, it can be said that the feeling of being judged under the spotlight is replaced by the feeling of presenting to a small number of participants in a quiet room. While the students said that this new experience enables them to present more comfortably and effectively, the jury members believe that interrupting the traditional jury experience will hurt the development of the students. In addition, it can be said that the interaction between the students and the jury members is weak due to not being able to make eye contact, not feeling their emotions, and not being able to follow their facial expressions. It is even more challenging to interact with participants whose cameras and microphones are off. Industrial design juries need a productive interaction experience with mutual information transfer and dialogue, not

just a session where the student makes a presentation and the jury members give their opinions.

Students who were waiting for the presentation and passing the presentation queue were doing different tasks by turning off their cameras and microphones to use their time efficiently. For example, while some students were lying in bed and resting, some completed their daily work. While this provides flexibility for students, it can also cause a decrease in the effectiveness of the jury. It is invaluable for students to learn from their classmates' presentations and critiques in addition to their own.

It would not be wrong to say that the different constraints of each participant's environment harm the interactions between students and jury members. Each participant has different concerns because they are not in the same environment and under the same conditions. Participants encountered difficulties such as other people in the house entering the room and talking loudly, unexpected movements of pets reflected in the camera image, knocking on the door, and the arrival of the cargo. Jury participants trying to fulfill their duties as jurors or students while dealing with different challenges can damage the quality of the jury experience.

4.3.4 Covid-19

An unexpected coronavirus pandemic has disturbed people's lives and caused massive losses worldwide since it was first discovered in China in December 2019 (Spitz et al., 2020). And they continue, campuses that were once places of social interaction have had to switch to online education without worldwide planning or preparation. In the METU industrial design department, juries started to be conducted online rather than face-to-face, with a rapid transition. It would not be wrong to say that educators and students tried to preserve the jury streaming experience online in many ways. For example, students make a presentation by pointing to the appropriate place of the project poster, and the jury members give feedback by sketching the project poster. However, it is not possible to fully maintain

the face-to-face jury experience online. Online juries have their own unique experiences with their possibilities and constraints. Before the Covid-19 pandemic, there was very little research and resources on online design juries. Therefore, it would not be wrong to say that it may not be possible to predict the online jury experience before the pandemic. However, somewhat similar to the face-to-face jury experience was also carried out in online juries. It can be said that the effect of online tools and platforms is significant. Online juries were conducted utilizing the advanced features of online tools and platforms.

Most of the research participants stated that they quickly adapted to the fast transition to online juries and that the juries take place in online tools and platforms. This may be because today's youth are familiar with digital tools and are natural users of the language of the digital world (Iranmanesh and Onur, 2021). Similarly, in research conducted after the covid pandemic in India, more than 53% of respondents said it was extremely easy or easy to transition to online teaching, and only 14% found it difficult (Varma & Jafri, 2020). On the contrary, some students and jury members stated that they had difficulties in the transition due to unpreparedness and the psychological crisis during the pandemic. Lack of technical knowledge, proper devices, and pandemic conditions may have caused this. Social segregation was one of the tactics employed to stop the spread of the disease, so staff and students ran their business remotely. (Ozturk et al., 2021). Challenging conditions during the pandemic may have helped participants remember their online jury experience as compelling. Among these conditions, the participants' being worried about their own and their family's health, being away from the social environment, and being unable to be in different physical environments due to social closure can be counted. Many of the participants also stated that these challenging conditions had positive effects. Students use their free time, caused by being at home and not being in social environments, to participate in online courses efficiently. Jury deliverables prepared by students who learn new tools and platforms and improve themselves through online courses have also improved noticeably, and their quality has increased. It can

be said that high-quality jury deliverables, which help the jury members better understand the project details, help the jury to be conducted more efficiently.

Participants believe that encountering new opportunities and restrictive experiences in online juries will also impact juries to be held after the pandemic. Although the traditional face-to-face jury experience continues, it would not be wrong to say that the continuation of the advantageous features of the online jury experience is predictable. It can be predicted that this situation will contribute to the development of the traditional jury experience that has been going on for decades.

CHAPTER 5

CONCLUSION

This chapter presents an overview of the study and explains the main findings for revisiting the research questions. Regarding this, first, the experiences of students and jurors in online industrial design juries are discussed, and second, potential design directions for online platforms are described. The chapter continues by explaining the limitations of the overall study and making recommendations for further research.

5.1 Overview of the Study

The aim of the study was to investigate online jury experiences of students and jurors in industrial design education. The thesis provides knowledge about the advantages of online juries and needs of students and jurors concerning the limitations of online juries. While aiming to explore their experiences, the thesis also aims to recommend some potential design directions of online platforms. To fulfill these aims, a broad literature review and two-phase research were conducted.

To fulfill these aims, the research questions were formulated and afterwards answers initially sought with a broad literature review (see in Chapter 2). The literature highlights the unique form of design education that goes back decades to the training held in design studios, design solutions presented in juries and so on (Zeng, 2017; Lee, 2006). The design jury is a learning and evaluation environment (Smith, 2011). It can be described as a traditional ritual as the jury setup, flow and seating arrangements have been similar for decades (Musa, 2020; Salama & El-Attar 2010; Webster, 2006). The traditional design jury experience has changed by taking place online along with all educational programs around the world in recent years due to

the Covid-19 pandemic (Spitz et al., 2020). The literature supports that online education has many supportive aspects as well as many limitations for both students and educators. The role of choosing the right tool and platform in the online environment is critical for effective communication and education (Abramenka, 2015).

Following the literature review, two-phase fieldwork study took place which are online jury observations and semi-structured interviews (see in Chapter 3). Phase 1 is an observational study where the researcher participates in online juries as an observer in all 4 years of undergraduate industrial design education. It aimed to gain a comprehensive knowledge and general understanding of how industrial design juries are conducted online. In light of online jury observations, in Phase 2, semi-structured interviews are conducted to gain in-depth insights from students and jurors who experienced online juries. A total 13 interviews are completed which consist of eight students and five jurors. The qualitative data obtained from the two phases were analyzed and the main findings were explained together with discussions of the field research (see in Chapter 4).

In this conclusion chapter, after presenting this overview, research questions introduced in Chapter 1 are revisited. The chapter continues by explaining the limitations of the overall study and providing recommendations for further research.

5.2 Revisited the Research Questions

The thesis research was shaped around two main research questions. The literature review and qualitative data provided answers to these main research questions and also sub-questions.

i. What are the experiences of students and jurors in online juries in industrial design education?

i.i What are the advantages of online juries?

i.ii What are the needs of students and jurors concerning the limitations of online juries?

ii. What are the potential design directions for online platforms with a specific focus on industrial design juries?

The first research question provided in-depth knowledge about online industrial design jury experiences of students and jurors. The first research question helped to answer the second question. In other words, with the support of the in-depth knowledge from the first research question, potential design directions of online platforms are shaped. In this section, main and sub-research questions will be answered one by one.

i. What are the experiences of students and jurors in online juries in industrial design education?

Juries, whose primary purposes are evaluation and grading, have an important place in industrial design education (Musa, 2020). The design jury can be described as a traditional educational ritual (Salama & El-Attar, 2010) which has a basic flow that starts with a student presentation and ends with jurors' feedback. Although there is some research in the online design jury literature, the traditional jury flow has been face-to-face for decades. With the Covid-19 pandemic, educational institutions shut down, and education conducted online, including industrial design juries (Rashid, 2020). Although it was a fast and impromptu transition, as the research participants pointed out and supported by the literature review, the new generation of students being natural users of digital tools in their daily lives has made the transition to online relatively easy. (Iranmanesh & Onur, 2021).

Physical and online juries are noticeably similar in setting, flow, and procedure (Ceylan et al. (2020)). As seen in the jury observations, online juries start when all participants are connected to the video conference tool, and the student who will make the presentation takes the floor. The jury flow is similar for all students and starts again when each new student starts the presentation. Students prepare some

deliverables to explain their project ideas, processes, and product details to the jury members. Project posters, videos, and physical models can be counted among these deliverables. The student presents these deliverables and their details to the audience by sharing the screen. He/she plays the project video, points to the relevant part of the project poster by zooming in, and shows the photos of the physical model or itself from the camera. After completing the student presentation, the jury members give feedback on the current project and recommendations for future projects. Jurors can prefer to give feedback, both verbal and written.

During the jury preparation phase, which can be considered a part of the industrial design jury experience, the students were away from the studio environment because they were in the pandemic period. Although they use tools and platforms that support collaboration, almost all participants mentioned that peer-learning naturally decreases because of the lack of studio environment. It can be said that remote working harms the design processes and project deliverables and, therefore, the final juries (Ozturk et al., 2021).

As summarized above, online jury flow is similar to physical juries. Preferred tools and platforms significantly impact the online jury having a similar experience. However, after examined in more detail, it can be said that online industrial design juries have advantages and limitations for students and jurors.

i.i What are the advantages of online juries?

Conducting juries online in industrial design education creates facilitative, productive, and advantageous experiences for students and jury members. These new experiences can originate from both the features of the tools and platforms and the online itself. Online juries' advantages support industrial design education's development and efficiency.

Accessibility of jury sessions

Jury participants, including students, jury members, and guests are connected to the internet platform where the jury is conducted. As Chen & You (2010) mentioned,

there are no time and place constraints online. In other words, participants could join the same jury sessions regardless of the city and time zone they were in.

It is precious that both internal and external academics and professionals participate in the design juries as guest jury members. Online juries support and facilitate the inclusion of people from different disciplines, cities, or even countries (Iranmanesh & Onur, 2021). Without changing the physical environment, without spending time and effort, guest juries are included in the evaluation of students and contribute to their development (Ibrahim et al., 2020). Giving feedback on their projects from different perspectives increases the personal development of industrial design students and, thus, the efficiency of design education. While the number of participants is limited in physical juries, this number can be expected to increase in online juries. The flexibility of time zone and place also supports collaborating with firms and professionals on projects. Collaborating on projects in industrial design education can be considered as a common feature, but there are some limitations due to the need to travel. It is productive for industrial design students to carry out the project process by collaborating online with firms and professionals specializing in specific project subjects and participating in jury sessions with their contributions. In addition, students can participate in other design juries as listeners without changing their environment. Following presentations and feedback from different year levels and even different design field juries can help expand students' perspectives.

Visibility from device screen

Online juries provide convenience in terms of visibility. The visibility of the shared files is high as all participants attend and follow the jury session from their device's screen (laptop, computer, tablet, etc.). Students present the deliverables describing the project idea to the jury members and other participants by sharing the screen. Students can focus the audience on the specific area being described by zooming in while giving a presentation. For example, closely seeing many areas in the project poster allows the jury members to examine all the details and catch minor mistakes.

Therefore, it is recommended that students be more careful and check several times while preparing for online jury presentations.

Contrary to the visual advantage of sitting in the front row in the physical environment, all jury participants in the online environment receive the same display materials and follow project deliverables in the same way (Bender & Vredevoogd, 2006). Product renders, usage scenarios, videos, and technical drawings are seen in high quality as they are followed on the digital screen. While this advantage increases the impressiveness of the students' project presentations, it also helps the jury members grasp the project idea and details. Since the jury members have a good command of the project details, their contribution and feedback will also be fruitful.

In online juries, the timer positioned on a particular part of the screen is visible to all participants. Keeping track of the countdown by students and jury members helps the juries progress in the planned flow and time. While the students are making presentations within the specified time, they can adjust the speaking rate by checking the remaining time and ensuring that the presentation flow is under their control. Likewise, while giving feedback, jurors can check the remaining time to allow all other jurors to speak. Similarly, the fact that the names of all jury participants are visible on the screen in the video conference call can be said to support communication in online juries. Although all participants do not know each other closely, they can call each other by name while communicating one-to-one. For example, the guest jury members calling students and other jury members by their names can contribute to warm communication.

In online juries, jurors can provide feedback verbally, in writing, and the drawing. Using digital tools' features, they can draw on the student's presentation deliverables. Drawings can be used to suggest forms for physical model visuals, to add missing areas in technical drawings, and to criticize human interaction in scenarios. When considering drawing a small area on a small piece of paper or poster in an industrial design jury, drawing on the relevant area on the screen is more visible to students

and audiences. Therefore, in online juries, all participants see the same thing simultaneously, and visibility is simple.

Comfortability of students and jurors

As the seating arrangement supports, the design juries are considered a judgment environment; while the students are determined as the ones being evaluated, the jurors are the evaluators (Ilgaz, 2009). In the jury evaluation method, students have to stand in front of a blackboard or wall and defend their work, causing them to become anxious and stressed (Musa, 2020). This situation was considered one of the most significant obstacles to traditional jury evaluation. Musa (2020) mentioned in his article that the idea of a round table arrangement where students and jurors would feel like equal participants had been considered. In online juries, the traditional jury experience has changed regarding seating arrangement. In online juries, students and jurors are not in the same physical environment. Each participant participates in a different environment and can also arrange the environment he/she prefers. They can join the jury in comfortable clothes or even pajamas on a comfortable sofa. While participating in video conference tools, there is no difference between students and jury members, so hierarchical separation is not felt in online. In addition, during the presentation, students and jury members looked at their camera views less because they mostly followed the screen. Students do not feel themselves under the spotlight, and since not all eyes are on them, it can be said that students feel relatively more comfortable. In the research conducted with students from different design disciplines who participated in online presentations and online juries during the Covid period, these students emphasized that they felt more comfortable while presenting online (Fleischmann, 2020).

In addition, with the opportunity to take video and audio recordings in online juries, students can focus on jury feedback and think about their defense simultaneously without worrying about taking notes. When jury records are shared, students can watch their and classmates' presentations later. Students can watch their presentations to develop their presentation skills and make the jury comments useful

for their next project. In online design juries, it is an innovative and advantageous feature for training to follow the records later (Ceylan et al., 2020).

Due to anxiety and stress, many students believe they do not benefit much from jury feedback and cannot remember anything about their peers' projects (Anthony, 1991). The fact that students have less sense of being judged, being in a comfortable environment, and being able to watch the recordings later can make the students feel less stressed during the online jury session. Comfortability can be counted among the advantages of online juries. Students can benefit from jury feedback and their friends' presentations. It is an advantage that supports industrial design juries to be an efficient learning platform besides evaluation.

i.ii What are the needs of students and jurors concerning the limitations of online juries?

Making juries online in industrial design education causes restrictions for students and jury members. These constraints may be due to the need for both preferred tools and platforms as students and juries are physically in different environments. Due to the limitations of online juries, students and jury members have some needs to complete industrial design jury sessions efficiently.

Individual review

It can be said that following only the sharing of the student on the screen in online juries is restrictive for the jurors and the audience. Being able to review the project deliverables individually is among the needs of the jury members. While the student is sharing their project deliverables in the presentation flow, the jury members may want to go back in the flow or take a quick look ahead. In face-to-face juries, jurors could look at their preferred areas on the poster, but online juries are limited to the student's screen sharing. The subjects that the jury members attach importance to may vary according to their interests; for example, some focus on usage scenarios, while others focus on technical drawings. Sharing the student's project poster with

each audience may cause the jury members to review individually, while not being able to follow the student's presentation. Physical models among the project deliverables also need to be examined individually. Since the participants are not in the same physical environment in online juries, jurors cannot interact with physical models. Students make physical model presentations by adding photos and videos to the project poster or showing the model through their cameras. Physical model evaluation, vital in industrial design education, is only done in 2D on the screen. Since the jury members cannot experience the product usage, it becomes difficult to give feedback on the product's ergonomics, proportions, and form. Therefore, examining project deliverables individually in online juries is critical for jury members and other audiences.

Minimizing troubles

In online juries, troubles can be experienced due to physical environmental conditions, the internet, device, tool, and platform. These troubles can cause the flow of the jury to be interrupted or even stopped. Each participant is involved in a different environment, and their environment may not be suitable for the jury session. Students and jurors may have to deal with problems such as loud noise, poor internet quality, uncomfortable seating, or broken devices. Different concerns for each participant can undermine mutual communication and interaction on the same jury platform. The unsuitable personal conditions of students and educators in online environments, low internet connection, and other technical problems are among the reasons for the breakdown of mutual communication (Alnusairat et al., 2020). Students already excited and nervous during the jury presentation may have difficulty coping with and producing instant solutions for such problems. Even fear of encountering unforeseen misfortune and problems may increase excitement and nervousness. Similarly, the jury members may miss the students' presentations or may not provide feedback on the projects.

Presentation skills

Among the answers to the previous sub-question, the advantages of the online jury included a comfortable presentation by students. In addition, students talked about the convenience of making presentations online (Fleischmann, 2020). Although making presentations in online juries is interpreted as relatively comfortable and easy, as mentioned by the jury members in this research, it can negatively affect the development of the students. In addition, almost all of the students in this field study stated that they made their jury presentations by reading the plain text they had prepared beforehand on the screen. One of the most significant achievements of design juries is developing and improving students' oral presentation skills (Salama & El-Attar, 2010). Situations such as not presenting in the jury or reading plain text may obstruct the development of students' presentation skills.

Healthy communication

Design is an inherently collaborative and interactive process, and the online environment makes it challenging to provide these components (Fleischmann, 2020). Design jury sessions are supported by strong communication and commitment between students and jurors (Ilozor, 2006). The lack of face-to-face communication, eye contact, and following facial expressions can make it difficult for online juries to be participatory and have mutual conversations. Design juries are participatory and offer feedback, while conversations seem more advantageous than other assessment methods, such as exams and term papers (Ilgaz, 2009). Online juries have limitations in this regard. In the video conferencing tool, participants usually keep their microphones off, and only the camera of the presenter student/students is on. Also, jury participants can participate in online juries with cameras on or off. When presenters cannot follow the sound and image of the audience, they may need to be sure of their presence—in addition, not being able to make eye contact with the jury members and classmates and not getting feedback that they listened to him/her damages the communication between the students and the jury participants. The close communication link between student-student, student-juror, and juror-juror is

challenging to establish in online juries. Students stated that face-to-face communication is the most important thing to be added to the online environment and that video conference tools do not compensate for this reliability (Iranmanesh & Onur, 2021). Jury members from the participants of this thesis research said that the atmosphere of the jury is valuable. Unfortunately, they cannot feel that atmosphere in online juries. They described the atmosphere of the jury as an environment where the students could not hide their excitement, jury members supported them, and warm communication was provided both verbally and with eyes. Especially when the webcam is turned off, students cannot see the emotions of the jurors. Therefore, online juries lack a personal connection, which is among the reasons for the student's dissatisfaction (Alnusairat et al., 2020). In online juries, students and jury members need healthy communication.

ii. What are the potential design directions for online platforms with a specific focus on industrial design juries?

One way to conceptualize the design jury is as a ritual whose standard components, constituency, spatiality, choreography, and discussion come together to make the jury an unforgettable occasion for all to celebrate the end of a design project (Webster, 2006). There are some fundamental dynamics of the industrial design jury, which make it a unique educational environment (see in 2.2.2). Each of these dynamics is critical for the industrial design jury to fulfill its purpose as a learning and assessment experience. As the traditional jury experience shifts to juries held online, these dynamics must be effectively supported.

In the previous section, details of students' and jury members' online industrial design experiences were mentioned. While discussing the advantages of online juries, they were grouped under three themes: Accessibility of jury sessions, Visibility from device screen, and Comfortability of students and jurors. Regarding the limitations of online juries, the needs of students and jury members were explained with four themes: Individual review, Minimizing troubles, Presentation skills, and Healthy communication. The themes for the online jury experiences of students and jury

members create the potential for preserving and supporting online jury dynamics. While evaluating potential design directions for online platforms, a matrix containing the themes from conclusion section and jury dynamics from the literature was created (Figure 5.1). Considering that each jury dynamic will have its requirements and goals, the design directions proposed in this thesis research can be examined with more detailed studies. In addition, they will allow the development of different design directions.

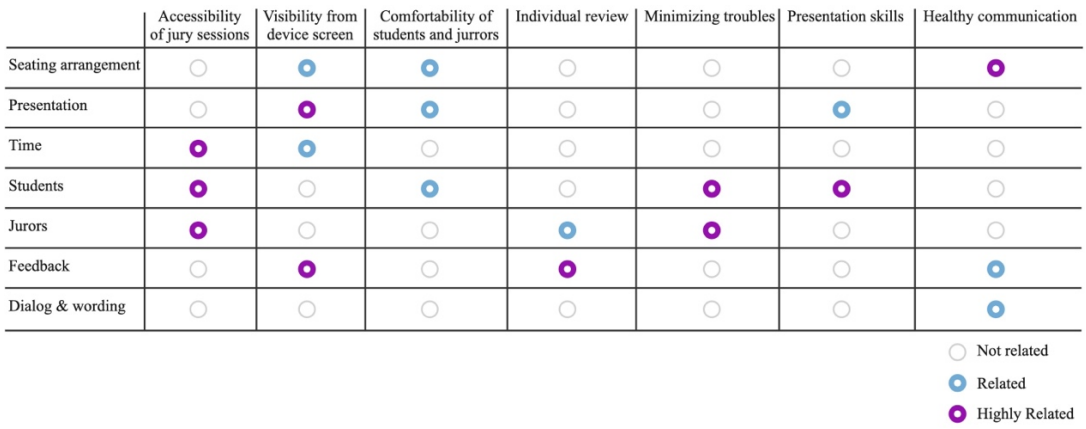


Figure 5.1 Matrix for creating potential design directions.

Seating Arrangement

The experience of the jury members sitting facing the students while they were presenting in front of their project (Webster, 2006), differed greatly in the online environment. Students feel more comfortable in jury sessions held online as they do not feel that the audience is staring at them and are not in the spotlight. In addition, the jury participants can adjust to the physical environment they are in as they prefer and feel comfortable. Therefore, the online jury experience offers comfortability and visibility advantages. Presenter students and others can follow the presentation materials on their devices' screen. With the effects of seating arrangement, jurors are seen as attackers in traditional juries (Boyer & Mitgang, 1996), so juries cannot be expected to be held very functionally (Salama & El-Attar, 2010). In online juries, it cannot be said that the hierarchy is noticeable among the jury participants on the

video conference platform. While this supports the comfortability and visibility advantages, it may cause the traditional jury experience to change drastically. While preserving these advantages on online platforms, design directions can be developed to preserve the traditional jury atmosphere. An interface solution can be suggested for the presenting student, which will reduce the tension and stress caused by being under the spotlight, and preserve a flat structure instead of a hierarchical structure. At the same time, inspired by the structure in the traditional jury system, an interface solution can be suggested for a structure that will make it easier for the audience to follow and focus by putting the presenter student in the foreground. For instance, a traditional jury environment can be created in the virtual environment by reflecting the jury order, the locations of the participants and jury atmosphere. Design solutions to be developed in terms of seating arrangement on online platforms can support the juries to be functional and efficient.

Presentation

In the jury sessions, the presentation is performed by the student and followed by the audience. Platforms used in online juries should have features that support students' and jurors' effective and efficient presentation experience. Video conference and whiteboard platforms used today have some of these features and provide convenience to jury participants. Screen sharing, zoom in/out, controlling presentation flow, and drawing on the screen can be counted among these features. Online platforms should be developed to support the traceability and fluency of presentations. In the study by Salama & El-Attar (2010), 71.72% of students think that using practical approaches significantly affects their final grades, regardless of design principles and ideas. With the contribution of the platform features, the satisfaction and efficiency of jury presentations for students and jury members can be maintained. Examining and testing industrial design jury presentations can help to develop new platform features. In this way, the features of existing platforms can be improved by customizing for design juries. At the same time, new features can be created to support students' visual and oral presentations.

Students believe that developing verbal presentation skills is among the essential aspects of final juries (Salama & El-Attar, 2010). This research showed that the vast majority of students in online juries read the pre-prepared plain text while presenting. Reading plain text with a lack of tone and emphasis can slow the development of students' presentation skills and make it difficult for the audience to focus. Multiple checking and rehearsing of the transcript are valuable for online jury presentations. For this reason, online platforms created for design juries can have features that allow students to easily read presentation texts and support natural speech flow. Design solutions that will support online presentations' natural and effective completion can be suggested for online platforms.

Time

Industrial design juries start on a predetermined date and time. In traditional design juries, all participants are expected to be in the same physical environment. In contrast, in online juries, participants can join from different environments or time zones. Local and global companies and professionals specializing in a particular field can participate in the juries without traveling. The influence of industrial design juries has increased with different perspectives and expert opinions. In addition to the flexibility of time zone and place, participants can actively participate in the juries to the extent that the online platform and environmental conditions allow. For example, internet connection and internet quality have a significant impact on jury participation. Online platforms can have features that allow free participation while preserving the advantage of time and space.

It is a challenging project for the student to finish since, one to eight weeks' worth of three-dimensional thinking must be condensed into a 10 to 20-minute presentation (Frederickson, 1990). Due to the excitement and stress during the jury, students may need help controlling their time. This may cause them to convey the project process and details to the jury members deficiently or incompletely. Similarly, while jurors give feedback, planning time control is critical for all jurors to contribute. Therefore, keeping track of time and its visibility on screen for students and jury members will

support jury sessions' planned and efficient completion. While most of this thesis study participants emphasized the importance of keeping track of time, some participants stated that it had a distracting and stress-increasing effect. The online platforms for design juries can have features that allow the jury participants to control time to their own needs and preferences. For example, with a customizable platform feature, students and jurors can set the time countdown to appear all the time, only a few minutes left, or not appear at any time. This will help industrial design juries complete the time and efficiency as planned.

Students

Students are one of the main characters of industrial design juries. Therefore, the platforms used in online juries must meet the needs of students. Students' goals include learning new information to improve themselves (Anthony, 1987) and transferring project ideas and details to jury members. Students prepare deliverables such as videos, posters, and physical models to present the design solutions and product details they have created. The need for each deliverable may be different. Design solutions can be suggested to cope with pointing out the relevant area on the poster while giving oral expression simultaneously. Physical model presentation, which has an important place in industrial design juries, was discussed as problematic in online juries. Physical models help the jury better understand 3D appearance, ergonomics, and product use. However, in online juries, students took photos of physical models and added them to the poster or showed them on a video camera. These solutions can reduce three-dimensional physical models to two dimensions and cause them to fail to fulfill their purpose. Making designs for physical model presentation needs is recommended by taking advantage of technological developments. For example, integrating technologies such as virtual and augmented reality into online jury platforms is one of the valuable design directions.

Jurors

Another important character of the industrial design jury is the jury members. Designing and developing the platforms used in online juries to meet the needs of the jurors can benefit students and jury members and enable projects to be evaluated more effectively. Jury members must have a good catch of project ideas and details to evaluate and contribute. In traditional juries, jury members can examine the project deliverables as they prefer. For instance, in the project poster presentation, different juries can examine different areas such as technical drawings, scenarios, and renders. In addition, they can examine the use of the physical model individually by experiencing it. However, in online juries, jurors usually follow the student's presentation by screen sharing and can only see the area the student is showing. Although there is the opportunity to examine the project deliverables on a different platform, this may cause the jury members to miss some areas because they do not follow the student presentation. For this reason, the platform to be preferred in the online industrial design jury must-have features that the jurors have a good grasp of the details of the projects and can examine them individually without breaking away from the presentation flow. In order to support this, solutions such as split screens can be suggested during the presentation of the students, such as the jury members seeing the screen that they control and the screen that the student controls at the same time.

Feedback

After students present sketches and prototypes of their solutions to a design brief in front of an audience, jurors provide feedback and suggest how the design could be improved and addressed (Smith, 2011). The traditional jury flow is continued in the online jury as in this order. Jurors ask questions, and students answer; jurors criticize, and students defend. The feedback session should involve engaging jurors and students in dialogue and be creative and productive rather than critical (Scagnetti, 2017). The challenges of online communication and interaction were discussed in this thesis research findings. In the feedback session, it is critical to research platform

design areas that will support and strengthen the mutual communication between the jurors and students and propose solutions. In addition to producing solutions for verbal communication, platform features that will strengthen communication and interaction with writing, drawing, and modeling will be beneficial. While developing design directions for feedback session needs, different feedback solutions can be evaluated for different deliverables. For example, platform features such as drawing tools for drawing on visuals or 3D modelling tools for giving feedback on physical models can be developed. In addition, solutions will benefit both the presenter student and other classmates so that the feedback and contributions of the jurors are not only specific to a student but also the whole design class. In this way, students can benefit from their presentations and other classmates' jury presentations and use their contributions for their following projects.

Dialogue & Wording

According to research by Smith (2011), he believed that jury feedback and critiques were demoralizing and often lacked constructive / encouraging comments. Students are likely to misunderstand and misinterpret a helpful critique, especially when they need to defend their work. It was mentioned that not being in the same physical environment, not being able to communicate face-to-face, and not being able to make eye contact are among the features that make it challenging to establish social communication. However, healthy communication and dialogue between students and juries in industrial design education will support the efficiency and importance of this unique education method. In juries with dialogue and style problems, hostility can replace logic and openness and make learning and listening difficult by bringing along one-way dialogue (Frederickson, 1990). The mutual dialogue between students and jury members is among the valuable design directions for online industrial design juries. Therefore, developing design solutions is critical by conducting detailed research on the problems experienced in communication and interaction. Platform features that highlight the people talking to each other or enable the participants to make eye contact can be suggested as an example.

5.3 Limitation of the Study

Online juries experienced in the Covid-19 pandemic restrictions in this thesis sample. Participants felt relatively weak emotionally and mentally due to their concerns about their own and their families' health, being completely away from social environments and being in an uncertain process in the pandemic. It can be predicted that the participants answered the interview questions by being influenced and taking reference by the negative conditions during the pandemic. The researcher had a hard time making sure the participants were objectively reporting their online jury experiences regardless of the pandemic.

All 13 interviews conducted with video conferencing tool, Zoom. Conducting online interviews can be open to some potential problems that are difficult to foresee. However, there were almost no technical or any problems in online interviews. Only one participant's internet connection slowed down for a short time during the meeting, causing the participant's video image and audio to freeze for a few seconds. In fact, it was easy to schedule a meeting with all participants, as there were no time and place limitations. The researchers and the participants conducted the interviews in a comfortable environment (mostly at home) and whenever they wanted.

The scope of the master's thesis and the deadline for the thesis submission did not enable the thesis study to be done in a larger sample and to produce more comprehensive conclusions. The conclusions of the study may not correspond to all undergraduate industrial design jury or to all design jury experience. And also, each potential design direction requires further research to be developed design solutions for online platforms.

5.4 Recommendations for Further Studies

To improve the current study, similar research could be conducted in a larger sample. In this thesis study semi-structured interviews are conducted with 3rd-year undergraduate industrial design students and jurors. For providing comprehensive

knowledge about online industrial design juries, studies involving participants of all years can be planned. Regarding this, more specialized potential design guidelines can be presented to address the main learning objectives of each year. In further research, online jury experiences can be examined not only for industrial design education but also for other design fields. These studies will be valuable for contributing to the development of design education.

The potential design guidelines for online platforms presented at the end of this thesis study can be the topic for further studies. First, researchers looking for a solution to the limitations and expectations of students and jurors in online jury experiences can conduct a field study by considering these directions. Second, researchers or designers can design platforms based on potential design directions and study on how well they meet the online jury participants' experiences. Further research can contribute to improving the experience of students and jurors, as well as industrial design education.

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APPENDICES

A. Ethics Approvals

The First Approval

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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Sayı: 28620816 /

24 Mayıs 2021

Konu : Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi : İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Dr. Öğr. Üyesi Senem TURHAN

Danışmanlığını yürüttüğünüz Etkin Cemre Yavuz'un "Endüstriyel Tasarım Eğitiminde Çevrimiçi Kritik ve Jüri Oturumları" başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve **237-ODTU-2021** protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

The Second Approval

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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Sayı: 28620816 /

14 OCAK 2022

Konu : Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

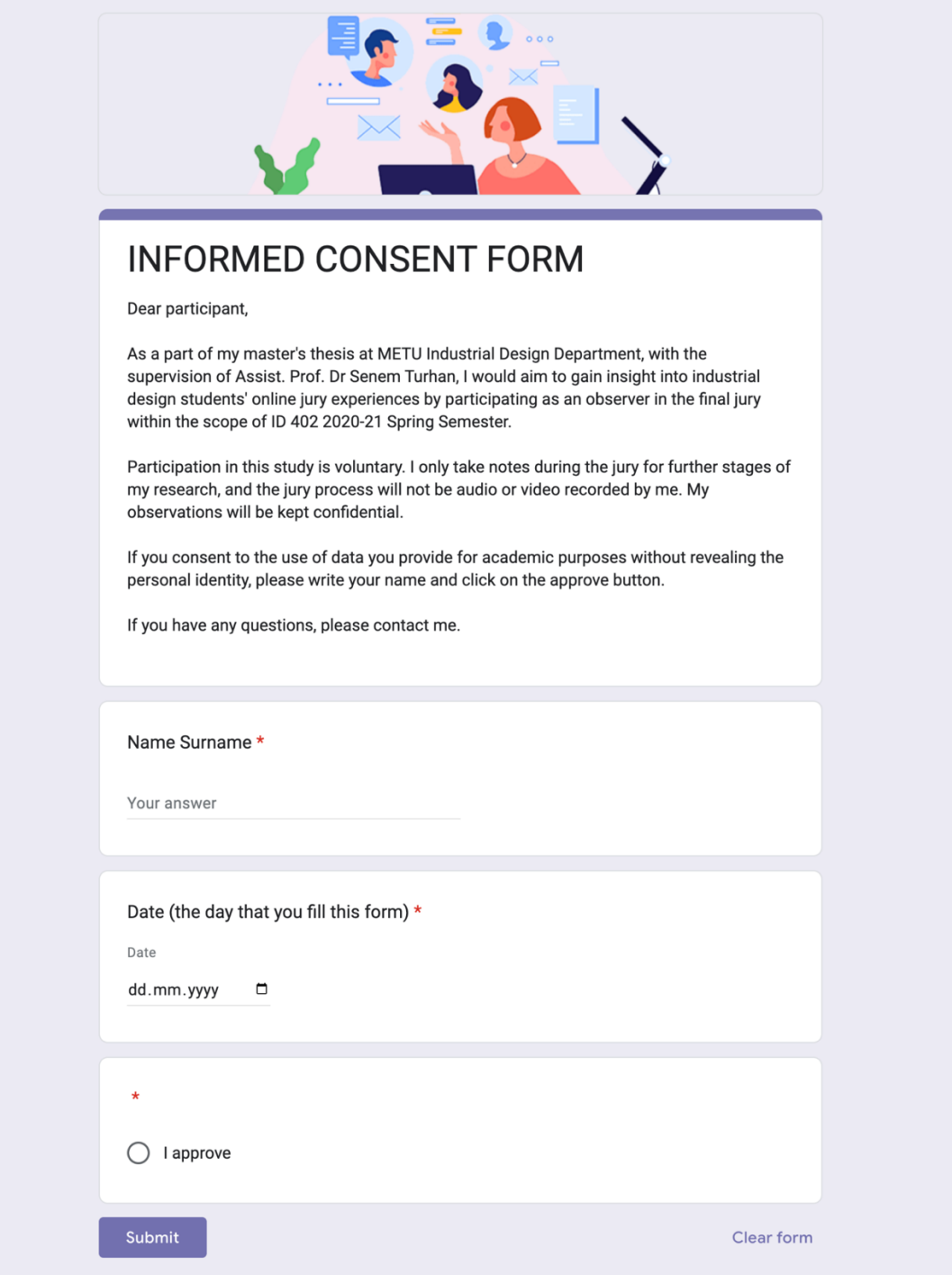
İlgi : İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Dr.Öğr.Üyesi Senem TURHAN

Danışmanlığını yürüttüğünüz Etkin Cemre YAVUZ'un "Endüstriyel Tasarım Eğitiminde Çevrimiçi Jüri Oturumları" başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve **0020-ODTUİAEK-2022** protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız.

B. Online Consent Form Example for Observations



INFORMED CONSENT FORM

Dear participant,

As a part of my master's thesis at METU Industrial Design Department, with the supervision of Assist. Prof. Dr Senem Turhan, I would aim to gain insight into industrial design students' online jury experiences by participating as an observer in the final jury within the scope of ID 402 2020-21 Spring Semester.

Participation in this study is voluntary. I only take notes during the jury for further stages of my research, and the jury process will not be audio or video recorded by me. My observations will be kept confidential.

If you consent to the use of data you provide for academic purposes without revealing the personal identity, please write your name and click on the approve button.

If you have any questions, please contact me.

Name Surname *

Your answer

Date (the day that you fill this form) *

Date

dd.mm.yyyy

*

I approve

Submit

Clear form

C. Consent Form for Semi-structured Interviews

Turkish Version

GÖNÜLLÜ ONAY FORMU

Sayın katılımcı,

Bu çalışmayı, ODTÜ Endüstriyel Tasarım Bölümü'nde yapmakta olduğum yüksek lisans tezim kapsamında Dr. Öğr. Üyesi Senem Turhan danışmanlığında Etkin Cemre Yavuz olarak yürütmekteyim. Konusunu "Endüstriyel tasarım eğitiminde online jüri deneyimleri" olarak belirlediğim tez çalışmamın araştırma ve tasarım ölçütlerinin kullanıcı odaklı bir biçimde belirlenebilmesi için bu araştırma çalışması kurgulanmıştır. Araştırma yaklaşık 45 dakikalık online görüşme olarak kurgulanmış olup, bu süreçte sizden online jüri deneyimlerinizi paylaşmanız istenecektir.

Bu çalışmaya katılım gönüllülük esaslıdır. Onayınız dahilinde araştırmanın sonraki aşamasında analiz etmek üzere ses kaydı ve notlar almak istiyorum. Görüşmemiz gizli tutacak ve kimliğiniz anonimleştirildikten sonra yalnızca benim tarafımdan değerlendirilerek akademik araştırma için kullanacaktır.

Sağladığınız bilgilerin akademik araştırma amacı ile kullanılması için onay veriyorsanız onaylıyorum kutucuğunu işaretleyerek yanıtınızı verebilirsiniz. Herhangi bir sorunuz olursa benimle iletişime geçmenizi rica edeceğim.

Etkin Cemre Yavuz

İsim Soyisim:

○ *Onaylıyorum.*

English Version

INFORMED CONSENT FORM

Dear participant,

As part of my master's thesis at METU Industrial Design Department, with the supervision of Assist. Prof. Dr. Senem Turhan, this research study is designed to determine the research and design criteria of my thesis, which is about "Online jury experiences in industrial design education", in a user-oriented manner. The study has been designed as an online interview of approximately 45 minutes, and you will be asked to share your online jury experiences during this process.

Participation in this study is voluntary. I would like to take voice recordings and notes to analyze at the next stage of the research within your consent. Interview will be kept confidential and will only be evaluated by me and used for academic purposes after your identity has been anonymized.

If you give consent for the information you provide to be used for academic research purposes, you can respond by ticking the I approve box. If you have any questions, I will ask you to contact me.

Etkin Cemre Yavuz

Name Surname

○ I approve.

D. Interview Questions for Students

Turkish Version

Merhaba,

Bu çalışmayı yüksek lisans tezim kapsamında Dr. Öğr. Üyesi Senem Turhan danışmanlığında yürütmekteyim. Konusunu "Endüstriyel tasarım eğitiminde online jüri deneyimleri" olarak belirlediğim tez çalışmamın araştırma ve tasarım ölçütlerinin kullanıcı odaklı bir biçimde belirlenebilmesi için bu araştırma çalışması kurgulanmıştır. Araştırma yaklaşık 45 dakikalık online görüşme olarak kurgulanmış olup, bu süreçte sizden online jüri deneyimlerinizi paylaşmanız istenecektir.

- Biraz kısaca kendinizden bahseder misiniz?

Geçtiğimiz dönem 2 tane jürinize gözlemci olarak katılma fırsatı elde etmiştim ama ben sizlerle görüşüp arka plan hakkında detaylı bilgi almak istiyorum.

Hazırlık Aşaması

Platforms

- Online jüri sunumunuza nasıl hazırlandınız?
- Sunumunuza hazırlanırken hangi platformları kullandınız?
- Platformların hangi özelliklerinden ve avantajlarından faydalandınız?
- Platformların kısıtlayıcı yönleri nelerdir? Bunları çözmek için neler yapılabilir?

İletişim ve etkileşim

- Online jüri sunumunuza hazırlanırken arkadaşlarınızla iletişiminiz nasıldı?
- Fiziksel olarak uzak olmanın bu etkileşime etkileri nelerdi?

Jüri Günü

- Jüri sunumuna kıyafetinize ve kamera görüntüsünde arka plana önem verdiniz mi? Ne gibi hazırlıklar yaptınız?
- Online jüri sırasında kamera ve mikrofonun açık mıydı? Ne zamanlar açıktı?

Platformlar

- Jüri sunumunuz sırasında hangi platformları kullandınız?
- Platformların hangi özelliklerinden ve avantajlarından faydalandınız?
- Platformların kısıtlayıcı yönleri nelerdir? Bunları çözmek için neler yapılabilir?

Yeni çözümler

- Yeni teknolojik özellikler ve yeni platformlar kullanmaya başladığınızda hangi kısımlarda zorlandınız? Neden
- Yaşadığınız bu zorluklara nasıl çözüm uyguladınız? Bu çözümlere nasıl ulaştınız?

Zaman kontrolü

- Sunum sırasında zaman kontrolünü nasıl sağladınız?
- Sunum yapan öğrenci ve jüri üyeleri için zaman kontrolü nasıl geliştirilebilir?

Görsel Kalite

- Proje sunumlarında proje tanıtımlarını içeren videolar ve ürün kullanımını anlatan çizim senaryoları hazırladığınızı gözlemlemiştir. Bu 2D ve 3D görseller ve videoların ürününüzün tanıtılmasında ne derece etkili olduğunu düşünüyorsunuz?
- Bu etkiler ve jürilerin online yürütülmesi arasında ilişkiyi nasıl yorumlarsınız?

Ortam

- Kendi sunumunuz sırasında ya da arkadaşlarınızın sunumunu izlerken dikkat dağıtıcı unsurlar ile karşılaştınız mı? Bunlar nelerdir?
- Bulunduğunuz fiziksel ortamın jüri sunumunuza ve takip etmenize etkileri nelerdir?

Teknik Problemler

- Online jüri sırasında teknik bir problem yaşadınız mı? Ne idi?
- Teknik problemleri nasıl çözdünüz?

Genel Değerlendirme

- Hem grup projesi hem de bireysel proje jüriler tamamladınız. Bu iki deneyimdeki jüri sunumlarını nasıl karşılaştırırsınız?
- Online jürilerde hocalardan aldığınız feedbackler ne derece etkiliydi? Memnun kaldığınız / kalmadığınız kısımlar nelerdir?
- Online juri deneyiminizi geçmişteki yüzyüze jüri deneyiminiz ile karşılaştırdığınızda nasıl değerlendirisiniz?
- Geniş bir çerçevede online jüri deneyimine baktığımızda geliştirilmesi gereken bölümler nelerdir?

- Eklemek istediğiniz bir şey var mı?

English Version

Hello,

As part of my master's thesis, I am conducting this research under the consultancy of Assist. Prof. Dr. Senem Turhan. This research study was designed to determine my thesis's research and design criteria, the subject of which I defined as "Online jury experiences in industrial design education" in a user-oriented manner. The research was designed as an online interview of approximately 45 minutes. You will be asked to share your online jury experiences during this process.

- Can you tell me a little bit about yourself?

Last term, I had the opportunity to participate in two of your juries as an observer. Still, I want to meet with you and get detailed information about the background.

Preparation

Platforms

- How did you prepare for your online jury presentation?
- Which platform did you choose to use while preparing your presentation?
- Which features and advantages of the platforms that you prefer to take advantage of?
- What are the limitations of the platforms? What can be done to resolve them?

Communication and interaction

- How was your communication with your peers while preparing for your online jury presentation?
- What do you think are the effects of being physically distant on these communications?

Jury Day

- Did you pay attention to your outfit for the jury presentation and the background of you on the camera? What preparations did you make?
- Were your camera and microphone on during the online jury? When was it on?

Platforms

- Which platforms did you use during your jury presentation?
- Which features and advantages of the platforms did you benefit from?
- What are the limitations of the platforms? What can be done to resolve them?

New solutions

- What parts did you struggle with when you started using new technological features and platforms? Why?
- What solutions did you think of to these difficulties you experienced? How did you come up with these solutions?

Time management

- How did you manage your time during the presentation?
- How can time management be improved for presenting students and jury members?

Visuals Quality

- It has been observed that you have prepared videos containing project presentations and drawing scenarios describing the use of the product in the project presentations. How effectively are these 2D and 3D images and videos promoting your product?
- How would you interpret the relationship between using 2D and 3D material and the juries being online?

Environment

- Did you encounter distractions during your presentation or while watching your friends' presentations? What are these?
- What are the effects of your physical environment on your jury presentation and watching your friends' presentations?

Technical Problems

- Did you have a technical problem during the online jury? What was it?
- How did you solve these technical problems?

General Evaluation

- You have completed both group projects and individual project juries. How would you compare the jury presentations from these two experiences?
- How effective was the feedback you received from the jurors in the online juries? What are the parts that you are satisfied/dissatisfied with?
- How would you evaluate your online jury experience compared to your past face-to-face jury experience?
- What parts need to be developed when we look at the online jury experience from a broad perspective?

- Is there anything you want to add?

E. Interview Questions for Jurors

Turkish Version

Merhaba,

Bu çalışmayı yüksek lisans tezim kapsamında Dr. Öğr. Üyesi Senem Turhan danışmanlığında yürütmekteyim. Konusunu "Endüstriyel tasarım eğitiminde online jüri deneyimleri" olarak belirlediğim tez çalışmamın araştırma ve tasarım ölçütlerinin kullanıcı odaklı bir biçimde belirlenebilmesi için bu araştırma çalışması kurgulanmıştır. Araştırma yaklaşık 45 dakikalık online görüşme olarak kurgulanmış olup, bu süreçte sizden online jüri deneyimlerinizi paylaşmanız istenecektir.

- Biraz kısaca kendinizden bahseder misiniz?

Geçtiğimiz dönem 2 tane jürinize gözlemci olarak katılma fırsatı elde etmiştim ama ben sizlerle görüşüp arka plan hakkında detaylı bilgi almak istiyorum.

Hazırlık

- Online jüri öncesi herhangi bir hazırlık yaptınız mı? Nasıl hazırlandınız?
- Jüri öncesi öğrencilerle ve diğer jüri üyeleriyle fiziksel olarak uzak olmanın aranızdaki etkileşime etkileri nelerdir?
- Hazırlık sürecinin iyileştirilmesi için önerileriniz nelerdir?

Jüri günü

- Jüri toplantısına kıyafetinize ve kamera görüntüsünde arka plana önem verdiniz mi? Bunun için ne gibi hazırlıklar yaptınız?
- Online jüri sırasında kamera ve mikrofonun açık mıydı? Ne zamanlar açıktı? Neden?
- Online jüriler sırasında geri bildirim verirken yeni teknolojik özellikler ve yeni platformlar kullanmaya başladığınızda hangi kısımlarda zorlandınız? Neden?

- Proje sunumlarında proje tanıtımlarını içeren videolar ve ürün kullanımını anlatan çizim senaryoları hazırladığı gözlemlemiştir. Bu 2D ve 3D görseller ve videoların projenin sunumunda ve jüri üyelerine aktarılmasında ne derece etkili olduğunu düşünüyorsunuz?
- Öğrenci sunumlarını izlerken dikkat dağıtıcı unsurlar ile karşılaştınız mı? Bunlar nelerdir?
- Bulunduğunuz fiziksel ortamın jüri sunumlarını takip etmenize ve geri bildirim vermenize etkileri nelerdir?
- Juri gününün iyileştirilmesi için önerileriniz nelerdir?

Genel değerlendirme

- Online jürilerde öğrencilere verdiğiniz feedbackler ne derece etkiliydi? Memnun kaldığınız / kalmadığınız kısımlar nelerdir?
- Online juri deneyiminizi geçmişteki yüzyüze jüri deneyiminiz ile karşılaştırdığınızda nasıl değerlendirirsiniz?
- Geniş bir çerçevede online jüri deneyimine baktığımızda geliştirilmesi gereken bölümler nelerdir?

- Eklemek istediğiniz bir şey var mı?

English Version

Hello,

As part of my master's thesis, I am conducting this research under the consultancy of Assist. Prof. Dr. Senem Turhan. This research study was designed to determine my thesis's research and design criteria, the subject of which I defined as "Online jury experiences in industrial design education" in a user-oriented manner. The research was designed as an online interview of approximately 45 minutes. You will be asked to share your online jury experiences during this process.

- Can you tell me a little bit about yourself?

Last term, I had the opportunity to participate in two of your juries as an observer. Still, I want to meet with you and get detailed information about the background.

Preparation

- Have you made any preparations before the online jury? How did you prepare?
- What are the effects of being physically distant with the students and other jury members on your interaction before the jury?
- What are your suggestions for improving the preparation process?

Jury day

- Did you pay attention to your outfit for the jury presentation and the background of you on the camera? What preparations did you make?
- Were your camera and microphone turned on during the online jury? When was it on? Why?
- What parts did you have difficulty with when you started to use new technological features and new platforms while giving feedback during online juries? Why?
- It has been observed that students have prepared videos containing project presentations and drawing scenarios describing the use of the product in the

project presentations. How effectively are these 2D and 3D images and videos promoting students' products?

- Did you encounter any distractions while watching student presentations? What are these?
- What are the effects of your physical environment on your ability to follow the jury presentations and give feedback?
- What are your suggestions for improving the jury day?

General evaluation

- How effective was the feedback you gave to students in online juries? What are the parts that you are satisfied / dissatisfied with?
- How would you rate your online jury experience compared to your past face-to-face jury experience?
- When we look at the online jury experience in a broad framework, what are the parts that need to be developed?

F. Checklist for Observations

ODTÜ METU

ENDÜSTRİYEL TASARIM BÖLÜMÜ

Endüstriyel Tasarım Dersi Proje Final Jürisi Gözlemci Kontrol Listesi I

GENEL

Bağlamsal

Online platform:

Öğrenci/Grup sayısı:

Jüri sayısı:

Grupların sunum sırası:

Sunum süresi kontrolü:

Ek olarak:

Öğrencilerin kameraları açık mı? Ne zaman açılıp kapanıyor?

Sunum sırası bekleyen öğrenciler ne yapıyor?

Sunum sırası geçen öğrenciler ne yapıyor?

Notlar: