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# THE PANDEMIC PERIOD AND ARCHITECTURE EDUCATION; COMPARISON OF HYBRID AND DISTANCE EDUCATION MODELS

## ABSTRACT

Architectural education, among the constantly developing and changing education models from the past to the present, has undergone fewer changes compared to other disciplines. However, the COVID-19 outbreak which emerged in 2020, forced many education disciplines to adopt the Distance or Hybrid Education Model. The distance/online education model has already been used for a long time. When architectural education practices are reviewed (individual projects, one-to-one critique, etc.), it is observed that applied courses are predominate and studio culture is of significant importance. Therefore, the premise that education models other than the traditional education model have significant effects on architectural education appears to be correct. Apart from determining the accuracy of the aforementioned hypothesis, the purpose of this study is to determine the positive and negative effects, opportunities and difficulties created by the distance and hybrid education models used during the pandemic period, and thus contribute to the future of architectural education. With this purpose in mind, a survey was performed for architecture students who have experienced both distance education and hybrid education models. According to the findings of the study, it has been observed that hybrid education and distance education models have significant advantages and some disadvantages for architectural education. It has been determined that future studies are needed to integrate these advantages into architectural education and to balance the disadvantages.

***Keywords:*** *Architecture education, pandemic, hybrid education, distance education.*

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## 1. INTRODUCTION

The COVID-19 epidemic, which suddenly entered the world agenda in 2020 and started to show its effects rapidly, caused great effects in various areas of life, from health systems to logistics, from the service sector to the education sector, and changed the existing paradigms in many areas. It is unthinkable for higher education institutions to be an exception to this situation. These effects showed themselves unexpectedly, and higher education institutions, like other educational institutions, entered a new process to continue their educational activities. Architectural education, especially in the field of architectural design education, has tried to adapt to this process. Studio lecturers, in line with the decisions taken, tried to ensure the continuity of education by making a rapid transition from formal education on campus to distance education (Yorgancioglu, 2020). However, when architectural education practices are considered, the applicability of distance education comes to the fore as a controversial issue due to the predominance of applied courses.

Architectural design studio courses are the courses in traditional architectural education where students can make drawings and models, and share ideas with lecturers and friends, and therefore communication and interaction are quite intense (Us, 2021).

According to the study of Us, in the distance education model, especially the conduction of studio courses emerge as a new problem area during the pandemic period. Some of these problems are that some students don't have enough opportunities or infrastructure to continue the distance education model, the internet-power cuts during the course, and the focusing problems due to the lack of interaction.

> "The effect of globalization on architecture has primarily been the easy access to information via technology. Thanks to publications on architecture and the tendency of architecture to the digital environment , it has become easier to obtain information from all over the world and to develop mutual information and projects" (Nalçakan & Polatoğlu, 2008).

In addition to the opportunities and positive effects provided by the interaction between technology and architecture, which Nalçakan (2006) mentioned, the remote delivery of some theoretical courses conducted in the hybrid education model has resulted in satisfactory outcomes both for students and lecturers. Thus, it is expected that distance education and hybrid education models carried out during the pandemic period may provide both some opportunities and negative effects as well as difficulties. Therefore, by contrasting the two educational models, it will be possible to better understand the consequences of each model and use the information gathered to design the method of architectural education in the future.

### 1.1. Aim of the Study

The purpose of this study is to compare the effects of the hybrid and distance learning models used in the pandemic process on architectural education, to identify the opportunities, benefits, and limitations they generate, and to finally discuss the findings in the context of the future architectural education planning. In the descriptive survey model developed in line with the stated purpose, there are various sub-research questions.

### 1.2. Importance of the Study

It is believed that the results of this study may contribute to the development and more effective application of Distance Education and Blended Education models in the field of, as well as provide a proposal for the development and transformation of architectural education practices Additionally, it is anticipated that it will help the process run more efficiently in order to be ready for potential epidemic and pandemic-like situations.

### 1.3. Literature Review

As a result of the literature review; It has been determined that there are many studies from different countries on architectural education, discipline and practices.

Nalçakan (2006), in her study, compared architectural education in Turkey and in the world, put forward the similarities and differences and made suggestions for architectural education in our country (Nalçakan & Polatoğlu, 2008)

Salama and Crosbie (2020), examined the impact of architectural education against the pandemic and suggested that some opportunities should be evaluated for the future of architecture (Salama & Crosbie, 2020).

Iranmanesh and Onur (2021) tried to identify and understand student experiences with the survey method in order to measure the effectiveness of distance education (online) architectural design studios conducted during the pandemic period (Iranmanesh & Onur, 2021).

Us (2021), taking as reference a period in which the architectural design studio was carried out with distance education during the outbreak of the pandemic; used observation, experience and survey method and revealed the strengths and weaknesses of the distance education architectural design studio (Us & May, 2021).

Oktay et al. (2020) obtained data with a semi-structured interview form and compared distance education and face-to-face education in order to understand how the virtual education environment of architecture students affects their organizational success (Oktay et al., 2020).

Varma and Jafri (2020) evaluated the suitability and the effectiveness of conducting architectural education via distance education model during the pandemic in India (Varma & Jafri, 2020).

Yorgancıoğlu (2020) focused on the development potential and weaknesses of architectural education applications of digitalization, which emerged as the architectural design studio continued through emergency distance education during the pandemic period (Yorgancıoğlu, 2020).

Ceylan et al. (2020), in order to evaluate the distance education model of the architectural design studio during the pandemic period, conducted a study with the students who experienced this situation with the survey method (Ceylan et al., 2020).

Karaaslan et al. (2021) aimed to think about the future of architectural education through the change and transformation of architectural education accelerated by the Covid-19 epidemic. The survey they conducted was applied to lecturers and architect educators (Karaaslan et al., 2021).

Şekerci et al. (2021) used a survey method in their studies, focusing on the sustainability of architectural education with distance education method (Şekerci et al., 2021).

As a result, in the studies examined, it has been tried to determine the various effects of the distance or hybrid conduct of architectural education both for the academic community and for architecture students. For this reason, this study was planned and implemented in line with the determined methodology, considering that the opinions of students who have experienced both distance and hybrid education models in architectural education are important.

## 2. MATERIAL AND METHOD

As the world we live in changes and transforms on a daily basis, so do our way of life, perspectives and education system. However, architectural education and practices appear to be resistant to change and transformation, and their commitment to traditional methods is stronger than new approaches. This can be explained by the fact that architectural education includes more intensive applied courses than other disciplines as well as the existence of studio culture (mutually interactive courses). However, emergencies and unusual situations such as the pandemic have forced all disciplines, including architecture, to adopt different education models. Understanding the relevance of these educational models in the discipline of architecture as well as the difficulties and some of the opportunities they have produced, is critical for planning the future of architectural education.

### *Methodology*

Based on the hypothesis that models other than the traditional education model have significant effects on architectural education, architecture students who have encountered both models were identified. A literature review was conducted to investigate studies in the subject. Descriptive survey

method and 5-point likert scale questionnaires were applied to the determined group. The survey data was analyzed and interpreted using the "IBM SPSS Statistics 25" program. The above-mentioned methodology was applied to compare the data gathered with each other, to find and quantify their relations.

***Limitations***

This study is limited to the students of Kırklareli University, Faculty of Architecture, Department of Architecture. Since the first year students of the Faculty of Architecture did not experience distance education (except for Turkish Language, Atatürk's Principles and History of Revolution, Foreign Language, Computer Usage courses), the data to be obtained from the first year students were not found reliable. In this direction, the study was carried out with Kırklareli University, Faculty of Architecture, Department of Architecture, 2nd, 3rd and 4th grade students. The 2nd, 3rd and 4th grade students of the Faculty of Architecture, Department of Architecture were included in the research because they experienced both traditional architectural education and hybrid education.

Often mentioned in this article,

**Distance education** can be differentiated into two types depending on whether all the courses are delivered synchronously or asynchronously online. The Synchronous Model describes the model in which the courses are conducted live in real time, while the Asynchronous Model describes the model that allows students to watch the courses whenever they want by recording them as soon as they are held live. In the distance education model applied in the Faculty of Architecture of Kırklareli University during the pandemic period, the courses were carried out synchronously and asynchronously.

Some universities in Türkiye and abroad offer students the opportunity to take courses from outside the institution using the distance education model, depending on the conditions determined by the institution. It is believed that taking courses taken from different universities/educational institutions broadens the students' learning environment and contribute positively to their education process.

**Face-to- face education (traditional education)** refers to the situation where all the courses are held in a classroom environment.

**Hybrid education** refers to the situation in which all weeks of applied courses such as Studio (an architectural design project), Building Elements, Technical Drawing, and similar ones are given in the classroom environment (traditional face-to-face education), while other courses are conducted synchronously and asynchronously through distance education. Distance education courses were delivered both synchronously and asynchronously under the hybrid education model used at the Faculty of Architecture at Kırklareli University.

At the start of the pandemic period, all the courses at Kırklareli University were generally delivered via distance learning, either synchronously or asynchronously. In the following periods, a distance education module (Microsoft Teams) was purchased by adapting to the current conditions, and distance education became more professional. In the period when the pandemic began to subside, the hybrid system was applied. In the period only when distance education was implemented, due to insufficient infrastructure, internet quotas of students and similar reasons, the duration of the courses was planned to be 20-40 minutes.

### 2.1. Traditional Architecture Education Before the Pandemic Period

Three primary characteristics stand out when the process of traditional architectural education is analyzed. These include two-dimensional drawings, three-dimensional drawings (perspective) and expressing designs with three-dimensional models. According to Nalçakan (2006), architectural education, which was practiced in a master-apprentice relationship prior to the industrial revolution, change into a school after that time.

> "Although today's architectural education shows some differences according to countries and institutions, it is still structured in a way similar to mutual interaction and a kind of master-apprentice relationship. Training plans are shaped jointly to develop

design skills. In order to develop these skills of professional candidates, intensive design and technical courses are given. In addition, the interdisciplinary approach in architectural education aims at multidisciplinary knowledge in terms of providing a strong interaction with other disciplines" (Rolla, S. et al., 2021).

"When we look at the discipline of architecture on a global scale, digitalization, which is gaining momentum, means that different thinking, analysis-synthesis and pre-planning tools such as collages, diagrams, drawings and models made in the computer environment during the design process; It is an undeniable fact that the design act has an important role in turning it into a final product" (Koç & Tuztaşı, 2020).

The conduction of the studios (project/architectural design) with the heaviest course load and density within the scope of architectural education plays an important role in traditional architectural education.

Before the pandemic period, Kırklareli University was also applying the traditional architectural education model in architectural education. However, some courses (Turkish Language, Ataturk's Principles and History of Revolution, Foreign Language, Computer Usage courses) were given via distance education, only the exams were face-to-face. Apart from this, the remaining field courses were completely face-to-face.

### 2.2. Architecture Education During the Pandemic Period

After the COVID-19 infection spread to be a global pandemic, the Higher Education Council (Yök) decided to suspend formal education at universities in March 2020 (Yök, 2020). This decision covers applied courses and all faculties. Within the scope of the decision taken, a distance education model has been proposed to higher education institutions in order to continue education and training activities. However, combined with the inexperience and lack of infrastructure that emerged in this unexpected situation, substantial negativities have been experienced in education. According to Sarı and Nayır (2020), there were some problems in interrupting traditional education and adapting to the new situation at the beginning of the pandemic, and this situation worried the education stakeholders. Based on the problems, it may be that this situation has not been experienced before. Identifying the problems related to this period with scientific methods and eliminating the lack of experience of education stakeholders will contribute to being prepared for these and similar situations that will occur in the future (Sarı & Nayır, 2020).

While the universities that already have a distance education infrastructure adapt to the process faster than those don't have a strong infrastructure have tended to work on information technologies and develop the existing ones.

As time passed on, according to the situation of the epidemic during the pandemic period, some universities developed and started using hybrid education models for applied courses that are difficult to conduct (especially in the field of health) with the distance education model. In the hybrid education model, practical courses are conducted face-to-face, while theoretical courses are conducted remotely. In addition, there are universities that continue their applied courses via distance education model in the later period of the pandemic. Different education models from each other; its effect on success, ease of use and sustainability are open to discussion and it is a subject that has the potential to contribute to educational disciplines. There are many studies examining the effects of different environments on organizational behavior patterns. It is especially important to investigate the effect of different environments on success at the beginning of the COVID-19 pandemic in 2020 (Oktay et al., 2020). In a way, it is closely related to the informatics infrastructure of the university which education models the universities apply. In this context, it is anticipated that a comparison of distance and hybrid education models with each other in architectural education will provide the necessary information to understand the situation.

#### 2.2.1. *Distance education model in architectural education*

"The concept of distance education refers to the education model where the student and the lecturer are not in the same physical place. Distance education studies were first on the agenda in Turkey in 1924. With the establishment of Anadolu University Open

> Education Faculty in Turkey, distance education took place in our higher education. Changes in technology and student characteristics in higher education over the years have made distance education over the internet popular" (Akdemir, 2011). The distance education model is an interdisciplinary field that eliminates the access problems between the lecturer, the student and the learning resources, and effectively makes use of the existing technologies to achieve this. In the distance education model, it is seen that information and communication technologies are used for learning-teaching purposes and these technologies form the basis of distance education (Bozkurt, 2017).

As Bozkurt (2017) pointed out, the distance education model, which was applied out of necessity during the pandemic period, was used to continue education activities by eliminating the distance and limitations between the student and the lecturer. The effective use of this model depends on having sufficient information and communication technologies, sufficient technological infrastructure of universities or educational institutions, and easy adaptation of the lecturer and the student to this model.

However, according to Dinçer, there are some difficulties and limitations that arise with the distance education model, as in the education models in other fields. The following are some limitations of the distance education model;

- Inability to establish the desired level of interaction in learning spaces,
- The technical problems that occur during the course cannot be solved immediately,
- Planning difficulties in students with weak study habits,
- Communication disorders that occur due to the large number of students,,
- Technological infrastructure cost (Dinçer, 2016).

In addition to the limitations that Dinçer (2016) has mentioned, the fact that the lecturer cannot offer correction and revision suggestions in a free way (the lecturer's concern that what he says may be taken out of the context and published in different media) in applied courses, which constitute an important part of architectural education, can also be considered as a limitation. It can be said that this situation affects the interaction between the lecturer and the student negatively. In addition, the distance education model is also divided into synchronous and asynchronous. In the synchronous model, while the courses are carried out simultaneously, that is, live, in the asynchronous model, the student can access the course recording, course document or presentation at any time (Demir, 2014). It should be noted that in distance education, the most preferred courses are to be recorded synchronously, that is, in real time and live, and students can watch them again whenever they want (synchronous and asynchronous). However, while the Council of Higher Education defines distance education in "Procedures and Principles Regarding Distance Education in Higher Education Institutions", it states that courses can be given synchronously (synchronously) or asynchronously (asynchronously) in the regulation. However, according to our practical experience, students' motivation remains very low in courses that are given only asynchronously. Additionally, while the duration of the course was 50 minutes in the pre-pandemic period, it is kept shorter (between 20 and 40 minutes) during the pandemic period, taking into account the motivation of the students, their access to technology, and the physical environment in which they attend the course.

### 2.2.2. *Hybrid education model in architectural education*

Due to the decline in the rate of spread of the COVID-19 epidemic and the decrease in its impact as the result of restrictive measures, some universities have switched from the distance education model to the hybrid education model. The hybrid education model is an education model in which practice-oriented courses are conducted face-to-face in the classroom environment, while theoretical or elective courses are conducted remotely. In this education model, the student has to be present at the university/training institution-organization on certain days of the week for applied courses. One main goals of hybrid education is to address the internet access issues, especially in the dormitories where students live remotely, due to the density.

> "*The rapid development of the epidemic crisis has provided educators and students with great flexibility, while also necessitating learning methods that have not been tried or*

*studied very well before*" (Chick et al., 2020). "*However, since distance education does not give the desired results, an alternative hybrid education model has emerged*" (Korucu & Kabak, 2020).

As Chick et al. (2020) explained, the hybrid education model provides students and lecturers with the opportunity to use time more efficiently. According to Korucu and Kabak (2020), a hybrid education model has been applied for courses or departments that cannot be carried out efficiently in the distance education model. While the distance education model has been implemented in the pandemic process in Turkey, hybrid training models are used in some universities and education programs for applied sciences such as architecture, medicine . In addition, if this model is compared with the traditional education model (face-to-face education), it is possible to say that the hybrid education model provides an advantage in some cases. For example, for the hybrid education model in architecture, synchronous and asynchronous conduction of elective theoretical courses with a relatively low course load, allowing students to watch the courses whenever they want, gives students time flexibility and offers the opportunity to concentrate more on applied and technical courses.

## 3. FINDINGS

In our study titled "Comparison of Remote and Hybrid System Architecture Education", Kırklareli University Faculty of Architecture Department of Architecture students were accepted as the universe. Due to their experience with both distance education and hybrid education models, 2.-3. and 4th- grade students were selected as the sample group, and a questionnaire was applied after obtaining the necessary permissions from the ethics committee. In determining the size of the sample group, Erişti et al.'s (2013) approach of "taking 20% of the universe as a sample" was taken as the minimum value (Erişti et al., 2013). As given in Table 1, the population of the survey consists of 273 students and 72 students (26%) in the sample of architecture students.

Table 1. Survey participation table (universe and sample group)

| CLASS | UNIVERSE | SAMPLE | UNIVERSE-SAMPLE (%) |
|---|---|---|---|
| 2 | 68 | 21 | %30 |
| 3 | 85 | 25 | %29 |
| 4 | 120 | 26 | %21 |
| TOTAL | 273 | 72 | %26 |

In the first part of the survey, the participants were asked questions about gender, class, studio attended, grade point average, and which computer-aided drawing program they used the most. In the second part, 10 questions were asked about the distance education model during the pandemic period, and 10 questions were asked about the hybrid education model in the third part, for a total of 25 questions. The applied survey data were transferred to the "IBM SPSS Statistics 25" program, and statistical results were obtained.

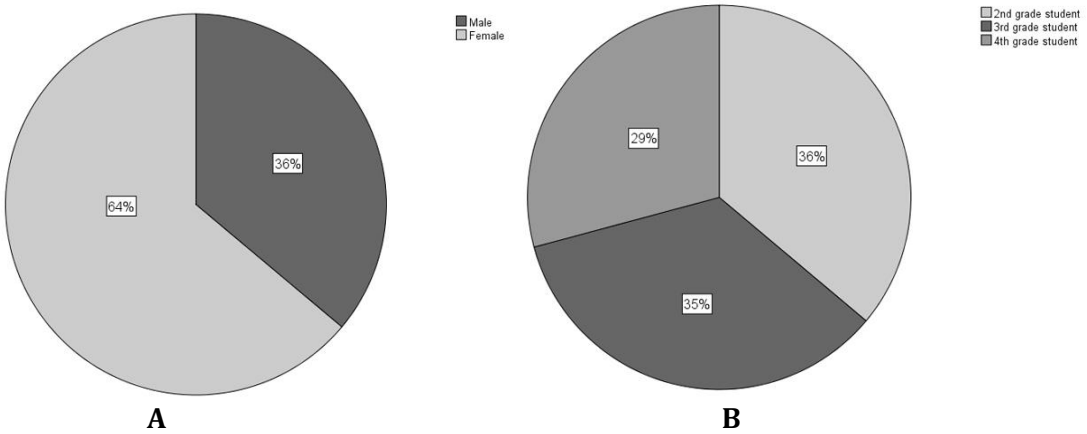
In the 5-point Likert scale used in the study, the Cronbach alpha coefficient was determined to measure the total score created by a multi-item measurement scale or the degree of random measurement error found in the mean. Demographic questions, which are the first 5 questions of the questionnaire, were not included in the test and the Cronbach alpha (α) value was found to be 0.836 (Table 2). It was found to be a highly reliable scale when compared with the Cronbach Alpha evaluation table.

Table 2. SPSS 25 Cronbach Alpha Evaluation Table

| RELIABILITY STATISTICS | | |
|---|---|---|
| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
| **0,836** | 0,843 | 20 |

In terms of gender of the participants, female participants are in the majority (Figure 1). When the classes of the participants were evaluated, it was observed that the participation rates of all three

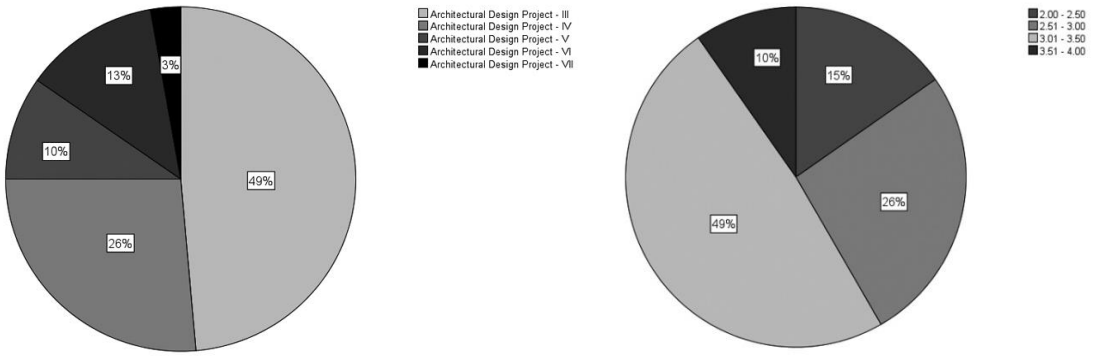
classes were close to each other. This situation is positive in terms of the reliability of the questionnaire.




**A** **B**

Figure 1. Distribution of survey participants by gender (A) and class (B)

Considering the studio levels of the participants, it was observed that the Architectural Design Project-III group constituted a significant density (Figure 2).




**A** **B**

Figure 2. Distribution of survey participants by registered studio (A) and weighted grade point averages (B)

In terms of "Weighted Grade Point Average" levels, students with 3.01 or higher account for 59% of survey participation.

Among the computer-aided programs, 79% of the participating students use AutoCAD the most (Figure 3). In general, the situation is similar in real life. However, in recent years, several drawing programs have been included in the curricula, and the use of visualization programs has increased remarkably. In addition, 3D drawings, visualizations, and virtual reality applications are expected to replace model- making in the traditional education method in the future. Currently, many companies provide services with virtual reality applications instead of physical sales areas. In addition to AutoCAD, Revit, 3Dmax, Photoshop, and other software have been added to the curriculum at Kırklareli University in recent years.

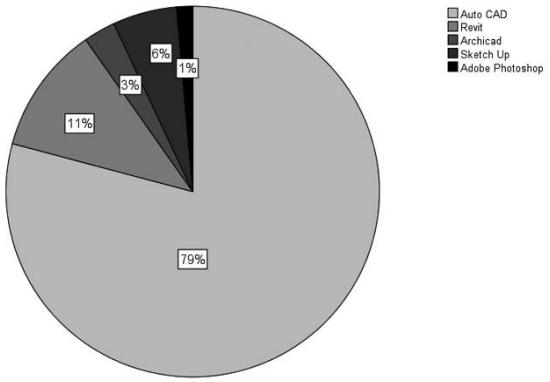



Figure 3. Distribution of survey participants based on the computer aided design sofware they use the most

During the distance education process, almost half of the students, such as 48%, experienced internet or electricity problems related to accessing the virtual course environment (Figure 4). This issue is a very problematic situation for distance education. This situation is seen as a controversial issue related to the right to equality in education. It is thought that in cases where the courses are not recorded in the virtual classroom system (not asynchronous), the students will not be able to follow the course and as a result, their interest in the course / subject will decrease. Even if the courses are recorded in the virtual classroom, especially in the studio courses, since each of the students draws their own projects, they can only listen to their friends' project evaluations and cannot get feedback about their own project. For this reason, infrastructure for distance education is a very important issue.

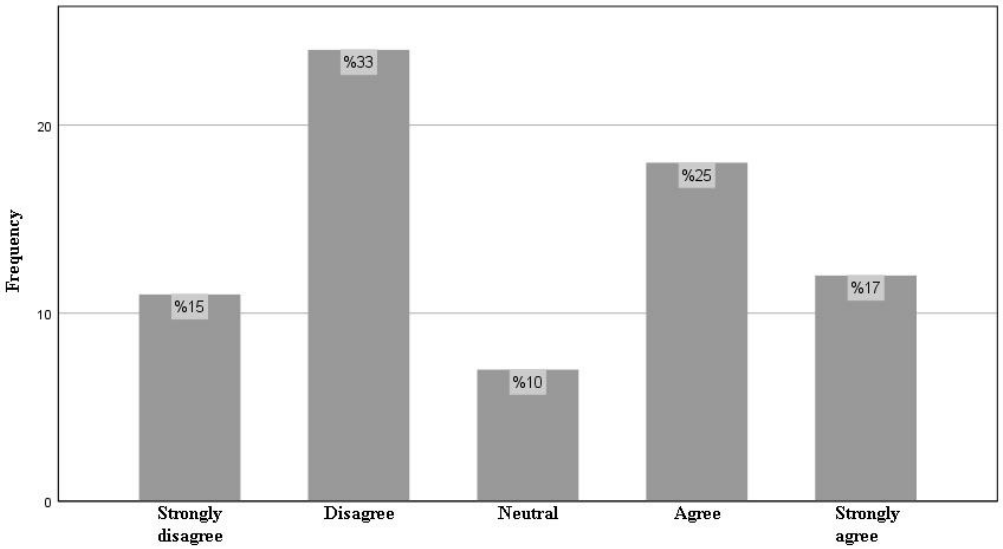



Figure 4. Distribution of the answers given by the students to the question "I had a problem with the internet or electricity while accessing the virtual course environment during the distance education process"

In the online courses during the distance education process, 43% of the students had difficulty in focusing, while 42% were able to focus. It is possible that this situation is related to the comfort areas of the students (Figure 5). In addition, the conditions (number of people, internet connection speed, thermal comfort, etc.) of the places where students stay (housing, dormitory, apart, etc.) are of great importance and affect the focus. All of these are challenges that a significant impact on learning.

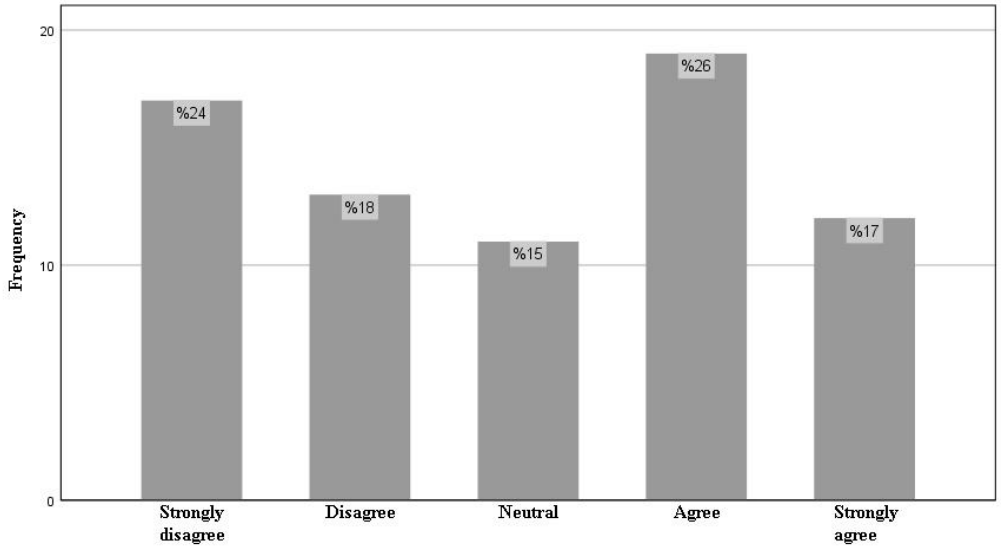



Figure 5. Distribution of student responses to the question "I had a focusing problem due to the online course"

During the distance education period, 50% of the students were not adversely affected in terms of course follow-up and motivation. While 18% of the students were undecided about this question, 32% said that they were negatively affected (Figure 6). It is thought that this situation is related to the personal working habits and enthusiasm of architecture students. Problems such as computer access problems, internet connection quality, or internet quotas may arise if the other siblings of students who have difficulty in following the course, for example, a student with multiple siblings, receive distance education at the same time. While device type or features are less important for students who attend classes in different disciplines only as listeners, device type (phone, computer, tablet, etc.) and features are also very important in areas that require practice (drawing or presenting), such as architecture. All these make it difficult for students to follow the course in real-time and negatively affect their motivation.

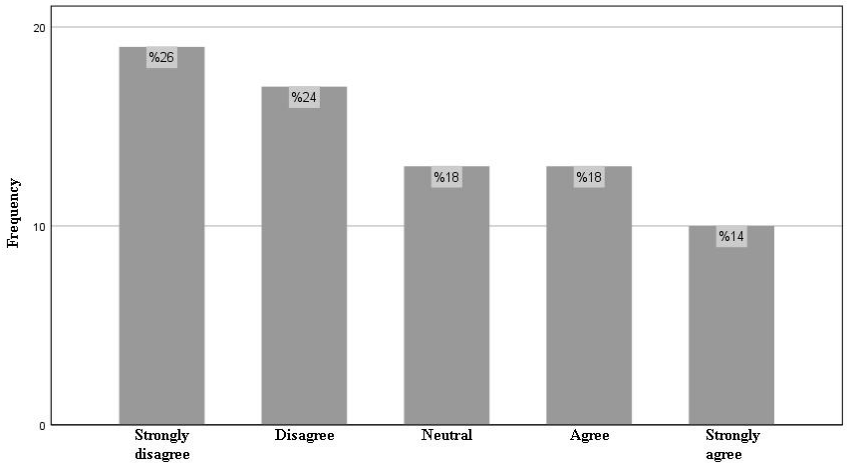



Figure6. Distribution of student responses to the question "I had difficulty in following the courses and my motivation was negatively affected"

When the studio-like practical courses carried out during the distance education period are compared with face-to-face education, 48% of the students stated that the interaction is not as efficient as in face-to-face education. When the undecideds are added, this rate rises to 63% (Figure 7). In line with this result, it is thought that the continuation of design studios that require interaction with distance education negatively affects the desired quality of education. The conditions of the physical environment in which the students are located are also very important. In some cases, students do not want to open their cameras, stating that the physical conditions are not suitable. In this case, it reduces the rate and efficiency of participation in studies that require group work or

interaction. In addition, it can be thought that the lecturers who teach the course feel more comfortable in face-to-face courses due to the fear of their speech being taken out of context and broadcast, and similar situations. In this case, it might be claimed that it lowers the quality of interaction.

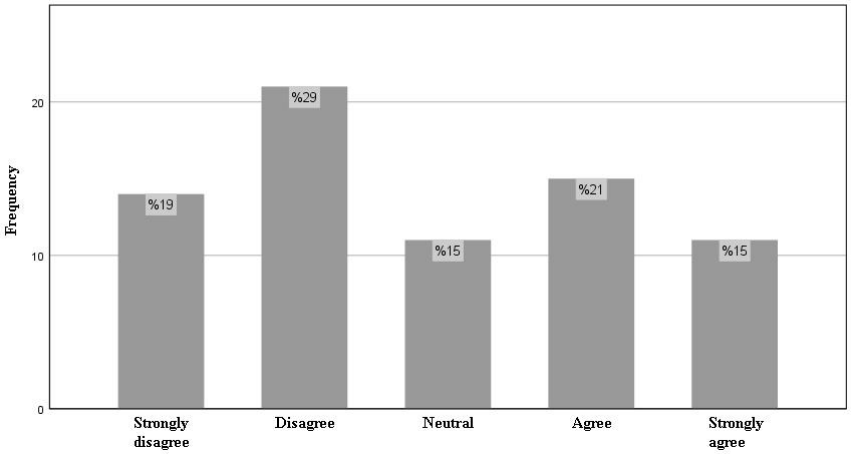



Figure 7. Distribution of student responses to the question "In the distance education process, we conducted interactive courses with the lecturers and my classmates as in the practical courses, as in the face-to-face education"

During the distant education period, 83% of students noticed the recording of studio courses in the system to be beneficial (Figure 8). Recording studio courses and making these records available to students under specific conditions might be regarded as an important opportunity that can be integrated into face-to-face education.

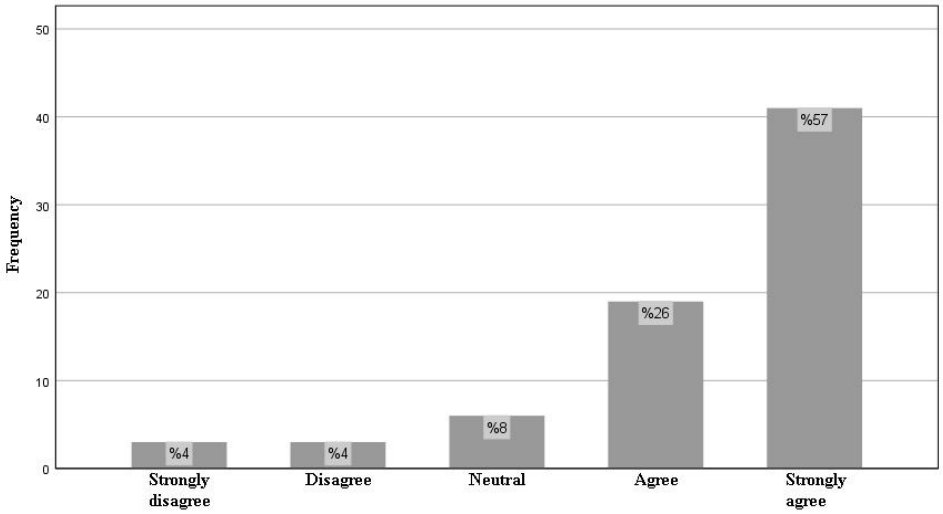



Figure 8. Distribution of student responses to the question "It is beneficial to keep the studio courses recording in the system because it creates the chance to watch the criticisms again"

While 58% of students found that following the studio/design courses delivered via distant education model from their own personal screen was more efficient, 18% were undecided (Figure 9).

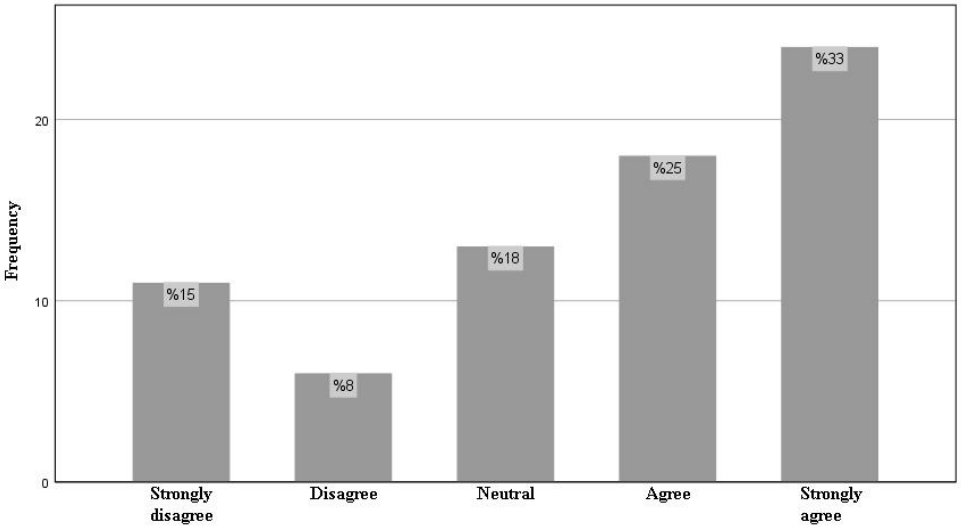



Figure 9. Distribution of student responses to the question "I followed the work of my friends in my project group and the criticism they received better compared to face-to-face education"

Students in face-to-face education are often busy with their own work and are unable to focus entirely on criticism of the projects of other students. This disadvantage, however, can be overcome if the critiques are recorded. As a result, it is important to take use of this advantage in distance education.

During the distance education process, 57% of the students said that they mentally prepared more comfortably for the jury and submissions (Figure 10). This can be explained by the stress imposed by the juries in the face-to-face education model on students. In addition, it is believed that students feel more comfortable in their personal spaces during jury preparation or presentation.

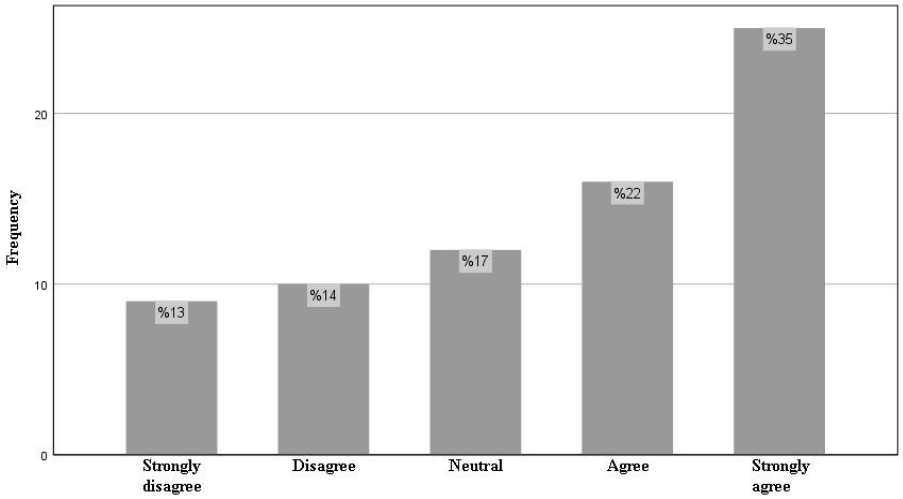



Figure 10. Distribution of student responses to the question "I was mentally prepared for the juries and submissions during the distance education process"

Approximately 70% of the students, including the undecided, agree with this hypothesis (Figure 11). For this reason, it is thought that there is a definite relationship between students' improved defense and the presentation of their projects in the distance education model. It can be thought that the students feel under pressure and cannot express themselves well when they are in front of the jury. In addition, the behavior of the lecturers in the juries towards the students, the time limit related to the large number of students, and conflicts among the lecturers can cause the students feel under pressure in face-to-face juries. However, it is thought that such issues should be examined in depth in future studies.

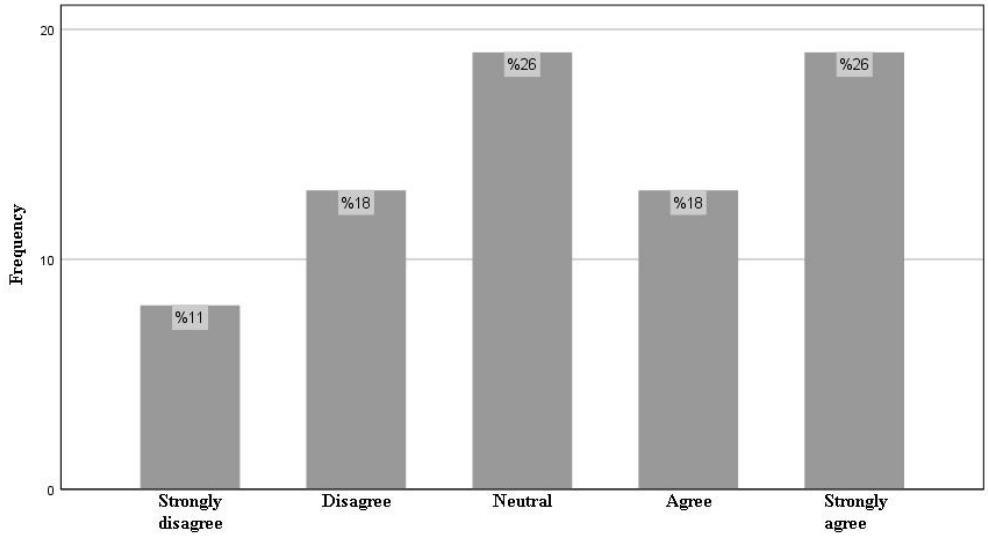



Figure 11. Distribution of student responses to the question "I presented and defended my project better during the jury in the distance education process compared to face-to-face education"

The distance education is, by definition, delievered using computer programs. 67% of the students think that they have made progress in computer aided design programs and other programs (Figure 12). This situation can be considered as one of the benefits of the distance education model.

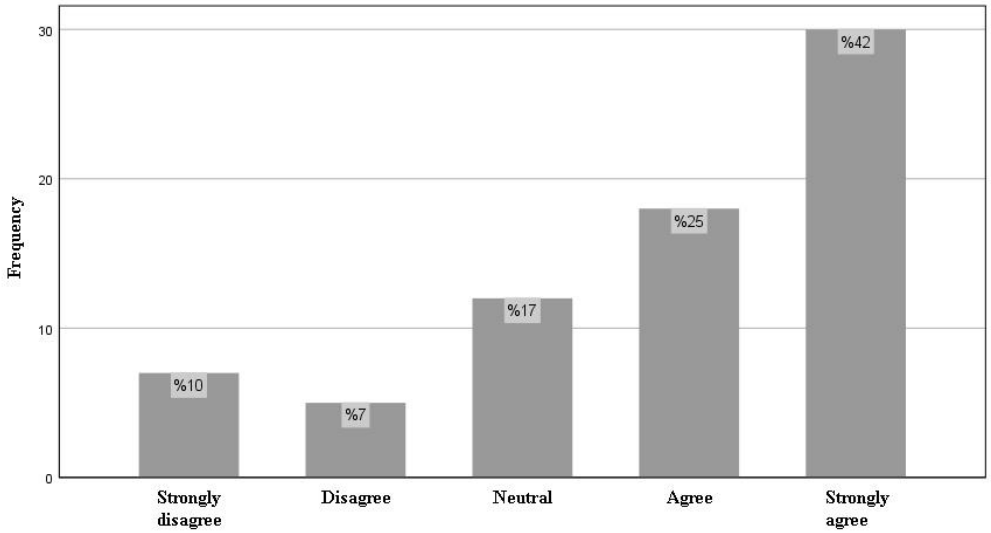



Figure 12. Distribution of student responses to the question "The education I received during the distance education process contributed to my development in computer aided design programs and other computer programs"

In the distance education process, 47% of the students think that restricting access to the social environment improves their success rate (Figure 13). Furthermore, with the start of the pandemic process, it is not expected that the correlation of success would results reliable results because the distance education model, which is experienced for the first time in architecture education, cannot be highly effective in evaluating the student. In the case of studies comparing success grades in the following semesters, it will be revealed if the increased success rate is related to a lack of exam security or the students studying harder. However, based environmental observations, it is thought that this situation is mostly related to a lack of exam security (especially cheating in theoretical courses, etc.).

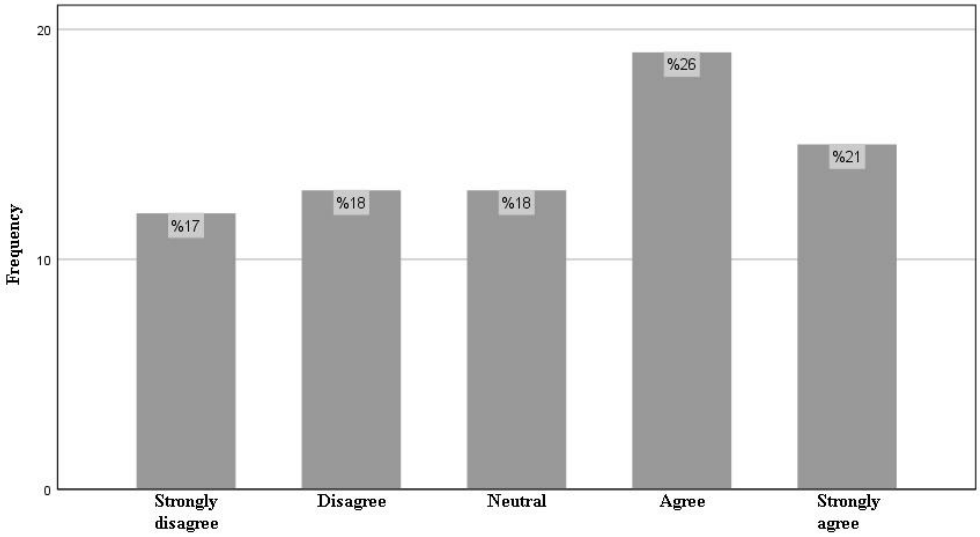



Figure 13. Distribution of student responses to the question "My success rate in the courses increased due to my distance from the social environment during the distance education process"

Due to the flexibility provided by the hybrid education model, 72% of the students think that they use their time more efficiently (Figure 14). It is thought that this opportunity has the potential to contribute to traditional education practices even after the pandemic conditions are completely eliminated.

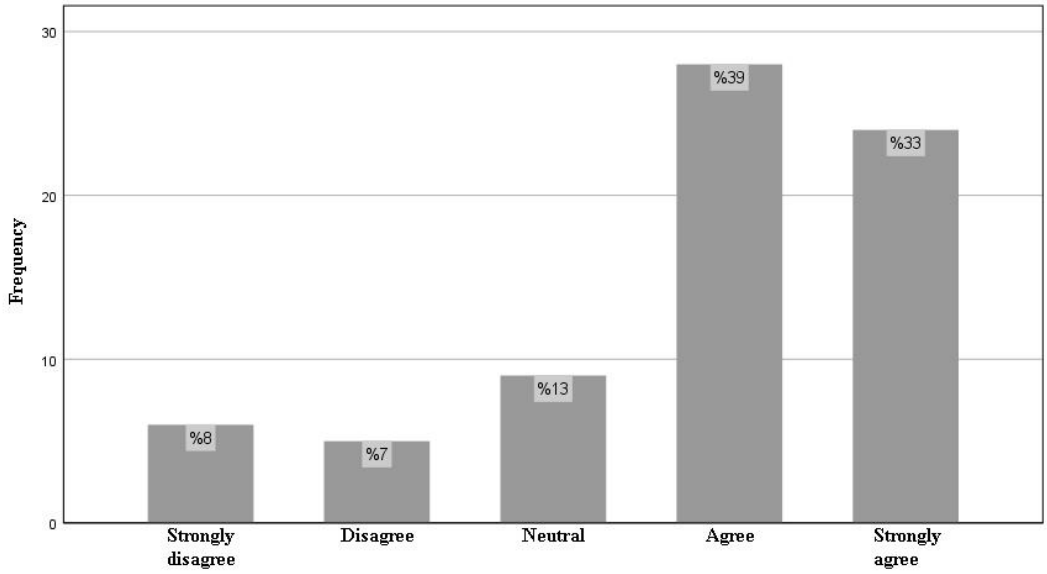



Figure 14. Distribution of student responses to the question "I use time more efficiently because the hybrid education system is more flexible than face-to-face education"

In the hybrid education model, face-to-face studio-like practical courses were found beneficial by 53% of the students (Figure 15). It is thought that the hesitancy of 19% of the students is due to some advantages in the distance education model. It is very important that this question is answered by students who have experienced both education models. The fact that the rate of students who do not agree with this hypothesis remains at 28% indicates that the hybrid education system (particularly project and some courses are conducted face-to-face) is more preferred instead of distance education.

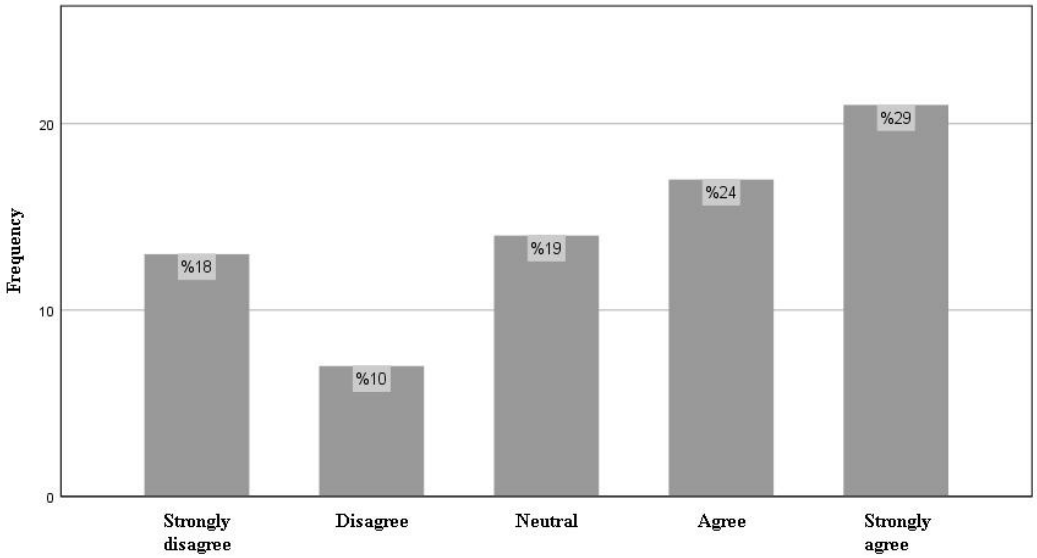



Figure 15. The distribution of the answers given by the students to the question "Continuing the practical courses conducted in the studio environment in the hybrid education system is more beneficial than the distance education"

The purpose of asking this question is to understand whether the two education models differ in terms of course duration. According to the feedback received from the students, there are no significant differences between the course durations in the hybrid education model and the course durations in distance education. However, approximately 41% of the students stated that the course durations were different (Figure 16). From this point of view, it can be said that the course durations in distance education may vary according to the lecturers, and it is more difficult to follow and control the course durations compared to the school environment.

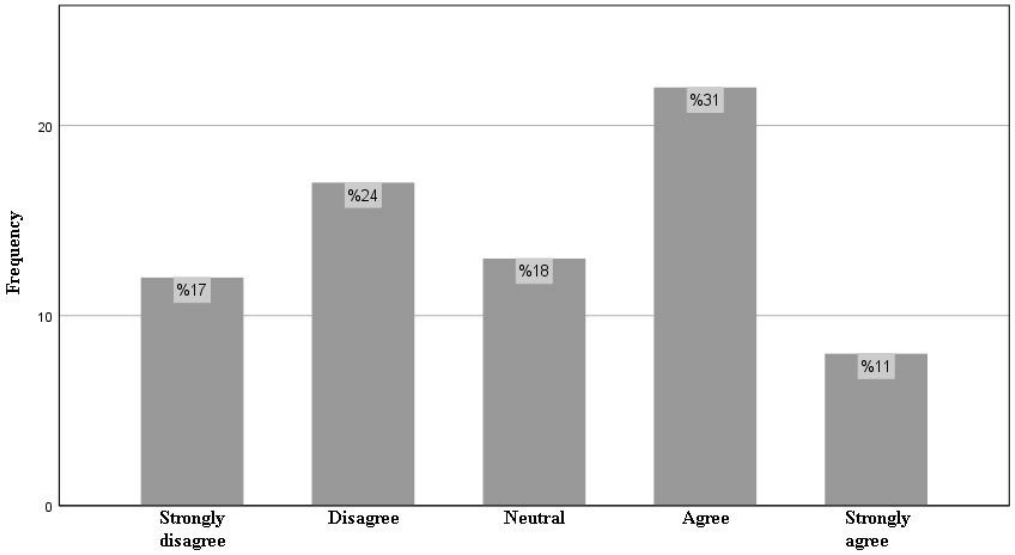



Figure 16. The distribution of student responses to the question "The duration of the studios conducted in the hybrid education system is the same as in the distance education process"

In the hybrid education model, 57% of the students said that they had no difficulty in communicating with the lecturer about the course-related issues (Figure 17). Thus, it is thought that the hybrid education model, which combines both face-to-face and distance education practices, does not pose serious problems in terms of communication.

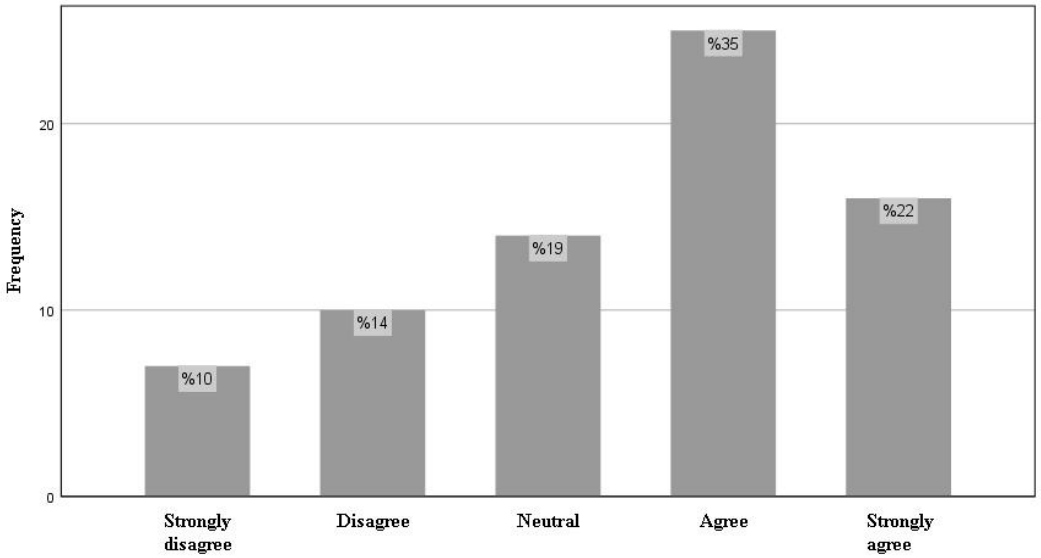



Figure 17. The distribution of answers given by the students to the question "I do not have any problems in communicating with the project coordinators for course-related problems or project revisions in the hybrid education system"

In the hybrid education model (project courses are face-to-face), 48% of the students agreed, while 35% did not (Figure 18). According to the feedback received from the students, several studies should be undertaken and discussed in order to understand the reasons behind this situation.

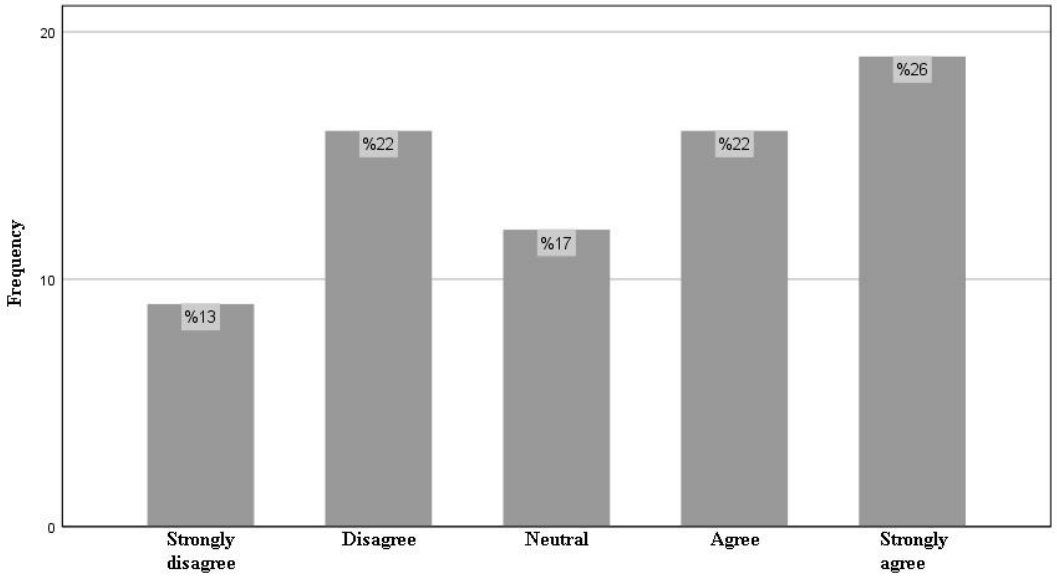



Figure 18. Distribution of answers given by students to the question "I benefit from project coordinators better in the hybrid education system compared to distance education"

In the hybrid education model, 50% of the students agreed, 27% disagreed and 24% were undecided that group work was carried out effectively (Figure 19). According to the feedback received from the students, it was not concluded that the effectiveness of the group studies in the hybrid model was as effective as it was in the face-to-face education.

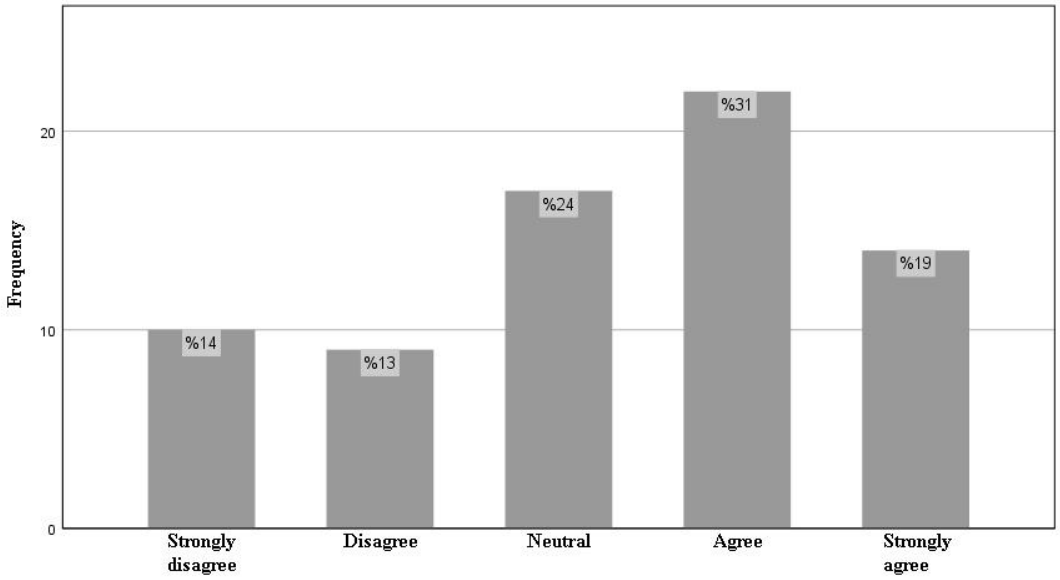



Figure 19. Distribution of answers given by students to the question "I can continue group work effectively in the hybrid education system"

In the hybrid education model, 48% of the students think that the projects they participate in are more successful than the projects they participate in through distance education (Figure 20). This can be explained by the interaction in the studio environment.

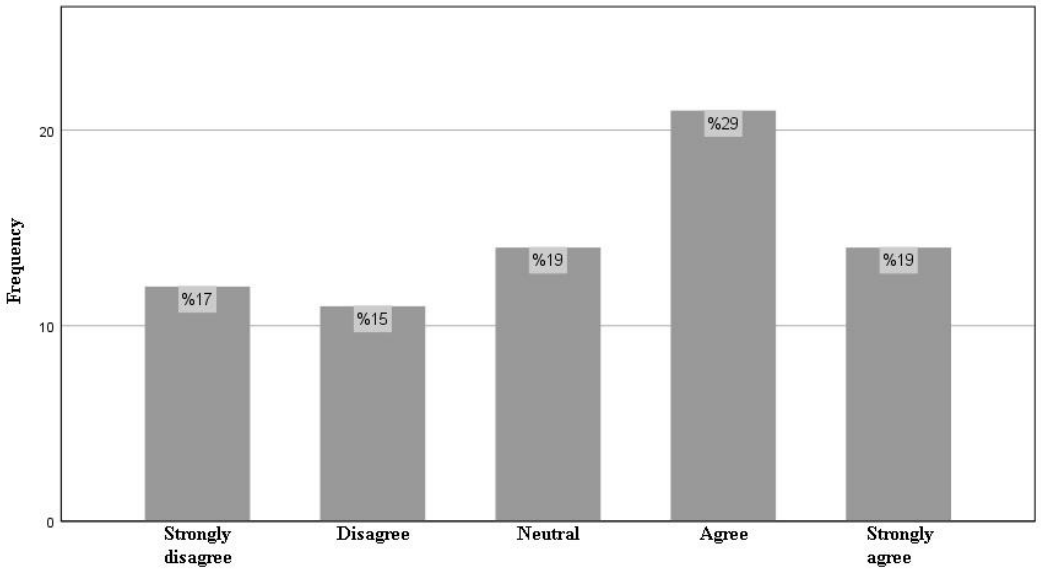



Figure 20. Distribution of student responses to the question "I think that the project or projects I carry out in the hybrid system are more successful than those in distance education"

While 56% of the participants preferred the hybrid education model, 21% were undecided (Figure 21). The fact that a considerable majority prefers the hybrid education model, which has not yet been studied and developed yet, suggests that it has the potential to be studied. It seems inevitable that the recognition of previous learning or certificates and similar processes will take place in the education system in the next years.

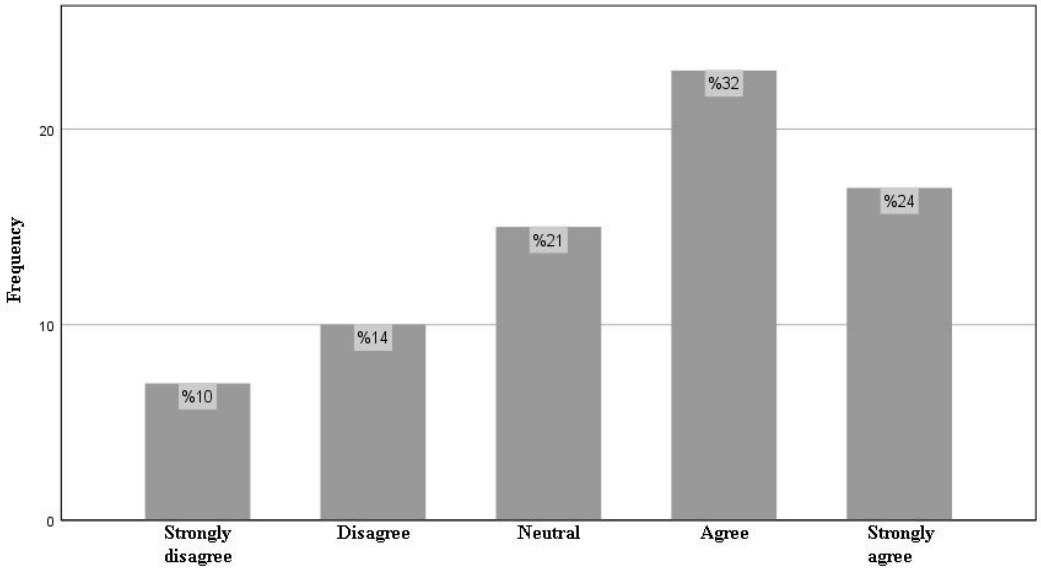



Figure 21. Distribution of answers given by students to the question "I would prefer architecture education to be a hybrid education system"

A significant part of the participants, with a rate of 71%, state that they would prefer the development of new practices/models in architecture education (Figure 22). In today's world, especially after the pandemic, education models are one of the frequently discussed topics. Architectural education is no exception to these discussions. Traditional course teaching methods, project teaching techniques, and real field conditions all have quite different dynamics. It can be suggested that new education models, for example, it may be suggested that the theoretical courses of the 4th grade 2nd semester be accepted as distance (synchronous and asynchronous) practice courses, and the applications in which the practical courses are accepted as internships in real field conditions, or the credits taken from different institutions with distance education can be accepted.

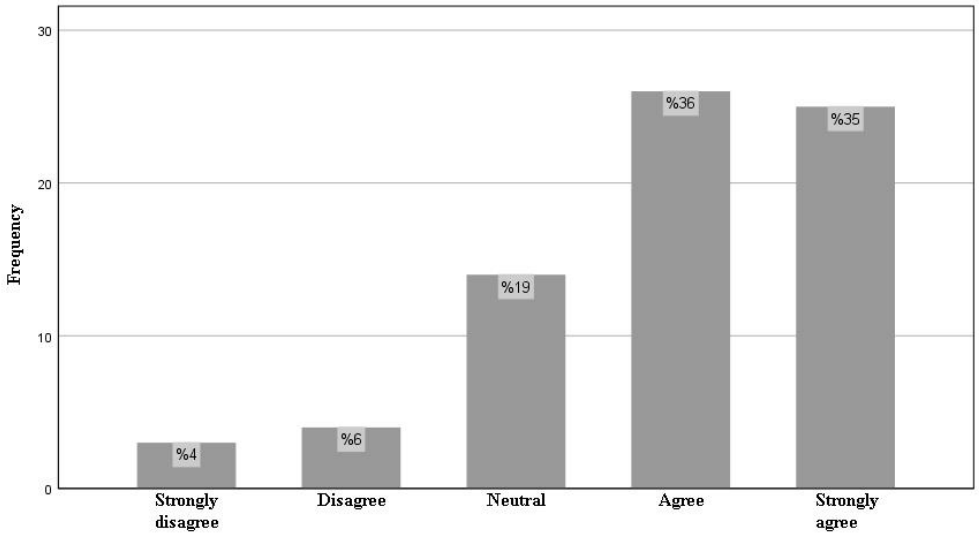



Figure 22. Distribution of answers given by students to the question "I would prefer the development of more different and innovative education models"

A significant part of the participants, with a rate of 83%, think that it is beneficial to take courses from different educational institutions and to include the courses in their transcripts (Figure 23). The realization of this situation under certain conditions such as accreditation has potential as it will add diversity to the educational experiences of the students.

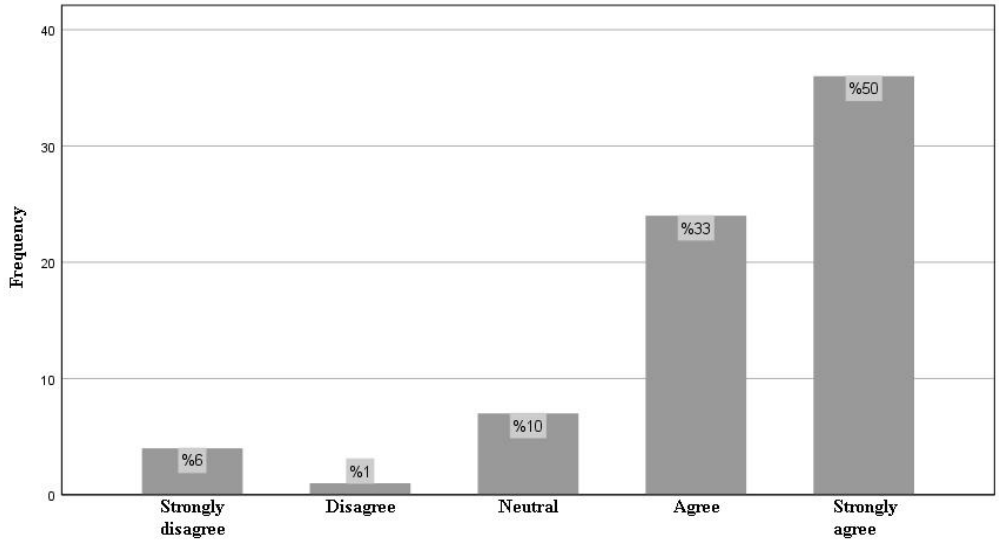



Figure 23. Distribution of answers given by students to the question "It would be useful to add it to my transcript in certified courses to be taken from different educational institutions"

## 4. DISCUSSION AND CONCLUSION

The sudden need to switch to distance education in the uncertainty environment that emerged with the onset of the pandemic period and the shift to hybrid education with infrastructure improvements in the later periods created an important ground for the analysis of the strengths and weaknesses of both education models with scientific methods. Since the students participating in this research have experience with each of the face-to-face education, distance education and hybrid education models, their opinions are an important data source for determining the necessary improvements.

> According to Yorgancıoglu, "These education models should not be seen as the "new normal" for architectural education. Preliminary studies should be carried out for new approaches by not ignoring the opportunities, potentials, as well as the difficulties-challenges offered by all the education models that have been experienced in architectural education so far (Yorgancioglu, 2020).

In traditional architectural education, the interaction, critique and cultural environment in design studios are the most important building blocks of architectural education. However, the continuation of theory-based courses through distance education offers flexibility and easy repetition opportunities for both lecturers and learners in terms of time and space. In the distance education model, which has been experienced in a short time, concerns about the security of assessment and evaluation still remain. For this reason, the Council of Higher Education has adopted the board' decision regarding in-person exams. Nevertheless, it is believed that the methods that will be developed in this direction in the future may achieve measurement and evaluation reliability.

This study focuses on performing an evaluation by using the feedbacks of the students who have experienced the distance education and hybrid education model in architecture. The following results were obtained by analyzing the survey data obtained as a result of the study.

- In the distance education model, students have communication problems in studio and similar courses that require mutual communication and interaction,
- Considering that the lecturers feel more comfortable in face-to-face courses, face-to-face education is more preferred for studio and similar courses, and their students benefit more from the project coordinators' experience,
- Although the digital environment (infrastructures) used for distance and hybrid education models have been improved institutionally, it is insufficient in terms of students' access to computers, internet connections and physical space conditions in which they live, and this situation results focusing issues,

- In hybrid education model specific to the department where the research was conducted, communication between the lecturer and the student can be easily ensured,
- In distance education, students feel less pressure from the jury and feel more comfortable in project presentations,
- Students think that they have more time for themselves due to the flexibility of time and physical space it offers, and they adopt the distance education and hybrid education model more because they focus on project drawings at this time,
- Students are open to improvements and innovations in education methods,
- In order to expand the learning boundaries and increase the diversity of the students, they prefer to take courses, and certificate-like teachings from different educational institutions under certain conditions, and this situation is positive in order to reach the desired quality of education if it can be supervised and monitored.

Along with the pandemic period, the change in the learning environment and methods has brought new regulations. Recognition and accreditation of achievements and certifications in different institutions by educational institutions are within these regulations. Architectural education cannot be considered an exception to these developments. For precisely this reason, it is thought that previous education, certificates, and achievements made by using scientific education methods will be recognized in architectural education in the medium term. In the case of recognition of previous learning, certificates or achievements, it can be predicted that the hybrid education model will soon replace traditional architectural education in the field of architecture.

In architectural education, each of the face-to-face, remote and hybrid models has advantages and disadvantages. Since these advantages or disadvantages are determined based on real field results, not the results obtained in the laboratory environment or group work, it can be said that they are very reliable data. New methods can be developed to be prepared for new situations that may arise in accordance with the quality of architectural education, by combining the reliable data at hand and analyzing them with scientific methods. Testing of success (assessment, evaluation and exam security) for courses conducted in digital environments in distance and hybrid education models is one of the subjects whose reliability has not been fully established yet. Exam security and the establishment of a reliable assessment and evaluation system are among the top priorities for the distance education and hybrid education. In addition, it is believed that this study will contribute to the literature because it includes real field results, the students participating in the study have experienced all three methods, and the previous experiences are shared in terms of rapid adaptation to the pandemic and similar environment-conditions that restrict educational activities.

**Author Contribution Declaration**

| | | | | | |
|---|---|---|---|---|---|
| ***A.*** | *Idea and editing* | ***B.*** | *Literature Review* | ***C.*** | *Writing* |
| ***D.*** | *Data Collection* | ***E.*** | *Analysis* | ***F.*** | *Critical Review* |

*Muhammed Enes IŞIK :* ***A, B, C, D, E***

*Ali MÜLAYİM :* ***A, C, D, E, F***

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