

During the Covid-19 Pandemic, Students' Opinions on Distance Education in Department of Engineering

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Abstract—The decision regarding the distance education method in Turkey on March 15, 2020, has completely changed the learning and teaching methodology of all university students and educators, and it has been seen that all courses have started to be given with distance education. The purpose of this research is to examine the perspectives of engineering university students towards distance education during the Covid-19 pandemic. The research consists of engineering faculty students studying at various universities in the Aegean region and Russian Federation. In the research, a scanning model was used. The data of the research were collected from 520 engineering department university students from various universities in our country, according to the convenience sampling method, and through an online questionnaire filled out by the students. Thanks to this wide participation, results have been obtained that will explain the Covid-19 process related to distance education in a good way. In general, it has been concluded that students are happy to see them in distance education model courses, so they do not fall behind in their education, and university students watch their courses mostly with the help of smart devices.

Keywords—Covid-19 pandemic process, engineering, distance education, university

1 Introduction

In today's world, there is a need for distance education for people who have differences in individual characteristics and qualities needed over time, constantly changing knowledge, desire for lifelong learning and desire to have knowledge from different fields [16]. It is also thought that this necessary situation in traditional education classrooms and environments seems impossible in terms of providing space and trainers to respond to requests [14]. In this context, individuals are known to prefer effective,

cheap, easy and less time-consuming ways in their education [3-5], as in all their studies, and it is seen that health factors lead people to distance education, as in the Covid-19 pandemic process [12].

The spread of distance education by showing itself in many fields and subjects has also affected formal education. It is thought that the use of technological developments will provide versatility to Zoom and training on other platforms [19]. The fact that any subject desired to be learned can be continued through live lessons without going to school or an institution provides many positive effects in formal education. As a result of the researches, a huge amount of data shows that distance education supports both the student and the educator. Other parts of this research will continue according to the purpose.

1.1 Conceptual framework

Distance education does not need the teacher and the learner to come together, and it eliminates the time and transportation costs spent to come together at the same place and time, as well as prevent health problems as in the Covid-19 global epidemic. We define distance education as distance education when there is a space and time difference between the learner and the learning resources [20]. The most important problem for distance education is the decrease in student motivation due to the lack of face-to-face interaction. When the student is together with the teacher, thoughts and feelings are much better understood and a more motivating environment for learning is created [11], [13]. In distance education, the teacher needs to make much more effort for the participation and attendance of students in classes, and people who do not have developed independent working skills may have problems in distance education [6]. Applications such as distance education teaching practice and school experience cannot offer appropriate learning environments within the courses [8]. During the Covid-19 pandemic period from 2020, all universities in Turkey completed their education and training processes with distance education [23].

At the beginning of the functions that make this form of education indispensable, it is seen that it saves time and space, offers a global education opportunity, in addition, distance education offers different types of learning together such as ease of learning (such as live lesson activities with virtual communication applications on the internet, voice or video chat), removing the boundaries in learning, virtual libraries and school without walls draws attention with its dimensions [1]. Distance education, which started as a language education in the past, has started to find application areas in almost every subject, including engineering subjects, and new approaches have been developed and significant progress has been made in adapting to different educational sciences [25]. It is seen that computer and communication technologies, business administration, engineering and science are among the fields in which distance education is most widely applied anytime and anywhere. When geographically re-searched, it is seen that Phoenix University provides only internet-based education, while Stanford University offers serious student potential, which is one of the issues advocated in the traditional education system. The point to consider here is the rate, quality and learning that will occur

as a result of this interaction [7]. It is an important problem that the multimedia equipment necessary to increase the quality of interaction in the traditional education system cannot be used at all classrooms due to the costs. However, thanks to the incredible developments in information and communication technologies in the information age, the traditional education system is being abandoned very quickly due to the ease of access to information and the reduction of costs, leaving its place to the learning-based e-learning system. Virtually, distance education or mixed learning, which is called learner-based education, there is a change in the traditional education system and it continues to be. Other parts of the research will continue by designing according to the problem situation of the research.

1.2 Related studies

Çelik's (2021) aimed to determine the perceptions of university students regarding their experience in the distance education process they used due to the Covid-19 pandemic, and as a result, they stated that they found it to be fast and easy access to the desired number of courses, increasing technological competence and being able to benefit from the course whenever they want. In this context, while it is seen that this research contributes to the data in the related research section, distance education is seen to be beneficial [9].

Sepulveda-Escobar et al. (2020) aimed to explore the challenges and opportunities of distance education and teaching experience in their work in (2020), and as a result, they concluded that despite the difficulties presented, this unique experience will contribute positively to the future careers of university students, at least to some extent. In this context, while it is seen that the difficulties in the related research part turn into an advantage over time, the difference and power of distance education also emerge [19].

Akcil, Uzunboylu and Kinik (2021), in their study during the pandemic period, aimed to examine the current results of existing studies on the integration of technology into teaching-learning processes in the literature, and as a result of the study, technology integration is a complex and multidimensional process with various dynamics and full integration is not possible [2]. They concluded that this study could not be achieved, if we set out in this study in the relevant research section, the model and method differ according to geographical location and student characteristics.

1.3 Purpose of research

In this study, it is aimed to examine the perspectives of engineering department university students towards distance education during the Covid-19 pandemic process. The answers to the following questions were sought for the general purpose determined.

1. What are the Daily Smart Device Usage Times of University Students?
2. What are the Daily Distance Education Usage Times of University Students?
3. What are the Views of University Students on Distance Education?
4. What are the opinions of university students about the Zoom application?

5. Is There a Difference Between University Students' Distance Education Status According to Gender Criteria?
6. What are the Distance Education Situations according to the departments?

2 Method

In the method part of the study, the information about which method was used in the study, which groups of students participated in the study, the type and source of the data in the study, the data collection tool and the statistics used in the study were included and organised.

2.1 Research model

In the study, the descriptive study method was chosen from the research methods and the survey model was used. The scanning method is a research method that aims to describe an event that has continued from the transitional experience to the present, as it is [24]. In this research, determination of the perspectives of university students of the engineering department towards distance education during the Covid-19 pandemic with the screening method was described according to gender, departments and education duration variables.

2.2 Working group/participants

Participant groups included in the research consisted 520 volunteer university students who continue their education at various universities in the Kosovo region. The measurement tool used in the research was applied to 520 university students with the help of an online questionnaire and was accepted.

Gender. In this section, the distinctions of university students according to their gender are given in Table 1.

Table 1. Distribution of university students by gender variable

Gender	Male		Female	
	<i>F</i>	%	<i>F</i>	&
Variable	265	50.96	255	49.04

The distribution of university students participating in the research according to the gender variable was determined and the information was examined (Table 1). 50.96% of the students (265 people) were male university students, while 49.04% (255 people) were female university students. The findings in the gender section reflect the actual gender distribution.

Daily smart device usage times of university students in distance education process. In this section, the situations according to the daily smart device usage time periods of university students regarding distance education environments during the pandemic were investigated and examined. Detailed information is given in Table 2.

Table 2. Distribution of university students regarding daily smart device time

Everyday Smart Device	1-3 Time		4-7 Time		8 and above hours	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Variable	47	9.03	158	30.39	315	60.58

The use cases of the smart device usage times that university students use daily during the distance education process are examined and detailed information is given in Table 2. Also, these time periods include both asynchronous and synchronous courses. While 9.03% (47 people) stated that they use the internet for 1-3 hours, 30.39% (158 people) stated that they use the internet between 4 and 7 hours and lastly, 60.58% (315 people) use the internet for 8 hours or more. stated that they use smart devices, in this context, it is seen that university students prefer 8 hours or more of daily smart device usage during the pandemic process.

University students' distance education usage process times. In this section, the situations of university students regarding the distance education environments during the pandemic process according to their daily usage time periods were investigated and examined (Table 3).

Table 3. Daily distance education usage period of university students

Daily Distance Learning Usage	1-3 Time		4-7 Time		8 and above hours	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Variable	34	6.54	103	19.81	383	73.65

College of distance education students in the process were examined and related to the time that they use on a daily basis, use cases, detailed information are given in Table 3. 6.54 percent (34 people) uses distance education in 1-3 hours for the time zone when uttered, %19.81 percent (103 people) in the range of 4-7 hours they expressed using distance education, and finally 73.65 percent (383 people), the use of distance education 8 hours and expressed, it is seen that university students prefer the daily distance education usage amounts of 8 hours and above during the pandemic process within the research as the most preferred.

Partition status. In this section, the department information of the university students in the study group was examined and detailed information is given (Table 4).

Table 4. Distribution of university students by department

Department	Computer Engineering		Electrical Engineering		Mechanical Engineering	
	<i>F</i>	%	<i>F</i>	%	<i>F</i>	%
Variable	424	81.54	82	15.77	14	2.69

The distribution of the study group university students according to their age status is considered and the relevant information according to the age scale is added to Table 4. 81,54 percent (424 persons) is observed to be in the 18-20 age range, while 15,77 percent (82 people), and finally 21-23 years old 2,69 percent (14 people) are in the age range of 24 and above. In the Age situations section, the findings reflect the actual distribution.

2.3 Data collection tools

When the data collection tool part is considered, it is seen that there is a measurement tool developed by the people who create the problem situation of the re-search within the research. The data collection tool was examined by experts in the field of distance education and the items that could not be suitable were removed from the study and verified. A personal information form called the "Distance Learning Methods" measurement tool was used, which was applied to university students and developed by researchers. The validity of the scope of the measurement tool developed was examined by experts with the title of 6 professors who conducted studies on distance education platforms and distance education, and unnecessary items were removed from the measurement tool and rearrangements were made.

Personal Information Form (Demographic Data). In the personal information form, information such as age, gender, internet use and daily distance education use environments are provided.

Distance Education Methods Data Collection Tool. A 5-point Likert-type questionnaire has been prepared to obtain information about Distance Education and Zoom video conference calls. 22 Items of the measurement tool consisting of a total of 24 items were used and 2 items were removed from the measurement tool thanks to expert opinion. The opinions of university students from two factorial dimensions, such as "Distance Education Usage" and "Zoom Video conferencing", were applied to the opinions of university students. The Cronbach Alpha reliability coefficient of the measurement tool as a whole was calculated as 0.87. Measuring tools; it is rated as "I strongly disagree" (1), "I disagree" (2), "I am undecided" (3), "I agree" (4) and "I definitely agree" (5). The measurement tool was also collected from university students in the form of an online environment.

2.4 Application

In the application part of the research study, 520 university students from various universities in Turkey were selected by researchers and live events were planned with the help of zoom video conferencing program, their time and use cases in distance education on live courses were prepared with zoom video conferencing application program and this event was organised by showing the experts in the field of educational environment, when the activity part of the research is over, it is planned to show videos and content for distance education use and zoom video conferencing for university students. during the 3-week training, university students will be offered live courses on field courses during the pandemic, such as "distance education use", "zoom", etc. such

information was provided to university students in the form of distance learning, and university students were expected to participate in this issue every week. after 3 weeks of training, an online measurement tool and an information form were applied to university students, and the data were given in the form of tables in the findings section. Education program used by most universities and is distributed through a Zoom Video Conference application in each designated section to section next week so will be limited to college students at more than 260 is set to be distributed to each training program is a 15-minute question and answer in the form of training 35 minutes Total Time 50 minutes with a group of college students in online education that has been processed frame tablet, phone, computer, and micro-phone Image by using devices such as were expected to attend training. The measurement tool applied to university students was collected through an online questionnaire and transferred to the SPSS program by coding them in the environment of calculation programs.

2.5 Analysis of data

In the analysis part of the data, statistical data obtained from university students were analysed in the Statistics program using frequency (f), percentage (%), mean (M), standard deviation (SS), t-test, One Way ANOVA with IRAs. The data obtained from the program are given in tables accompanied by numerical values, findings and comments.

3 Results

In this section of the study, the numerical findings obtained as a result of the analysis of the statistical data obtained in the study were added to this section in the form of tables, and various interpretations were included in accordance with the findings.

3.1 Opinions of university students on distance education

The findings regarding distance education of University Students are given in Table 5.

Table 5. Opinions of university students on distance education

No	Distance Education Opinions		
		<i>M</i>	<i>S</i>
1	I was able to log in very conveniently with the username and password given to me	4.42	0.50
2	When I entered the Distance Education system, I found the system useful	4.62	0.51
3	I was able to access all the materials through the Distance Learning system	4.57	0.65
4	I was able to get technical support when I had problems with the Distance Education system	4.45	0.50
5	I was able to access the Distance Education system from the device I wanted	4.60	0.60
6	I was able to share files through the Distance Education system	4.65	0.48

7	I had no problems with the e-exam application on the Distance Education system	4.57	0.50
8	I have not experienced internet and disconnection in the Distance Education application	4.62	0.49
9	I was able to communicate with the instructor who attended the lesson via Distance Learning	4.63	0.48
10	I can find anything I want through the Distance Learning system.	4.55	0.50
11	I would also like to see the Distance Learning system in my other courses	4.44	0.50
	General Average	4.56	0.51

When Table 5 is in the hands of college students regarding their opinions statistical distance education are among the findings, each answer carries a different meaning, although that is high on education of college students after the event on the basis of Table 5 remote views can be said of the research, from the most obvious expression, “I was able to share the file via distance education system” M=4.65 finding was reached. In addition, it was found that one of the most obvious expressions of the study was “I was able to access the Distance Education system from the device I wanted” M= 4.60. While it is seen that the opinions of university students about distance education are quite high, another finding is that “I can find everything I want through the Distance Education system” M = 4.55 was reached. Another finding of the study was that “I found the system useful when I entered the Distance Education system” M= 4.62 and “I was able to access all the materials through the Distance Education system” M=4.57. In addition, another value of the research is the finding that “I have not had any problems with the e-exam application on the Distance Education system” M = 4.57 was reached, and finally, it seems that the overall average M = 4.56 was reached.

The views of college students regarding distance education methods come out looking pretty good, as well as a high level of susceptibility of university students in distance education systems is that they are able to share the file system via distance education, distance education system, from any device they choose they can get by that they have not had any problems in process applications, simple and useful are among the findings that they found. In this context, it can be said based on the findings that distance education of university students is positive because all the values in Table 5 have a positive meaning.

3.2 Opinions of university students about the zoom video conferencing application

The findings regarding the Zoom video conferencing application of University Students are given in Table 6.

Table 6. Opinions of university students about the Zoom video conferencing application

No	Opinions about the Zoom Video Conferencing Application		
		M	S
1	Online lessons conducted in Zoom Video Conferencing environments are more effective	4.52	0.50
2	Taking classes in Zoom Video Conferencing environments has allowed me to devote more time to myself in my daily life	4.79	0.64
3	Instant correspondence and asking questions with the teacher describing the lesson in a Zoom Video Conferencing environment is a very effective method	4.58	0.54
4	It is more effective for me to consolidate the course by accessing the course record processed in the Zoom Video Conferencing environment	4.75	0.63
5	It is an advantage for me to be able to learn the information in my field courses anytime and anywhere with the Zoom Video Conferencing application	4.80	0.65
6	In a live course environment, I don't experience any disconnections when processing the course	4.70	0.62
7	I have the opportunity to learn how information technologies are used to take classes in a Zoom Video Conferencing environment	4.53	0.63
8	I can use my ability to chat while taking classes in a Zoom Video Conferencing environment	4.77	0.65
9	I can join groups created in the Zoom Video Conferencing environment at any time.	4.55	0.50
10	I can access live course recordings of lectures held in the Zoom Video Conferencing environment at any time	4.48	0.49
11	I would be happy to see the Zoom Video Conferencing system at other events and classes	4.60	0.55
	Overall Average	4.64	0.59

Regarding their opinions of college students are among the findings of statistical Zoom video conferencing applications, each answer carries a different meaning, although college students views on education that is high after the event on the basis of Table 6 remote can be said of the research, from the most obvious expression, “to take courses in Zoom Video Conferencing environments helped make more time for myself in my daily life,” $m=4.79$ finding was reached. In addition, it was found that $M = 4.80$ is one of the most obvious expressions of the research: “It is an advantage for me to be able to learn the information in my field courses anytime and anywhere with the Zoom Video Conferencing application”. While it was seen that the opinions of university students about the Zoom Video Conferencing application were quite high, another finding was that “I can use my ability to chat while taking classes in a Zoom Video Conferencing environment” $M=4.77$. Another finding of the study was that “I don't have any disconnections in a live course environment while studying” $M= 4.70$ and “I would be happy to see the Zoom Video Conferencing system at other events and courses” $M=4.60$. In addition, another value of the research is that “It is more effective for me to consolidate the course by accessing the course record processed in the Zoom Video Conferencing environment” was found to be $M= 4.75$, and finally, it seems that the overall average was $M= 4.64$.

The views of college students concerning the application of Zoom Video Conferencing is high when it is seen, they do not face any problem in zoom, a video conferencing application, Zoom Video Conferencing environments disconnect the live classes that they haven't had in, Zoom Video-Conferencing from the time and place of

their choice, they can participate in live classes, zoom, a video conferencing application with your friends than texts stated that they enjoyed. In this context, it can be said based on the findings that Zoom Video Conferencing of university students is positive because all the values in Table 6 have a positive meaning.

3.3 Distance education status of university students according to gender criterion

In this section, the distance education status of university students according to the gender variable is examined and the information about whether there is a significant difference is given in Table 7.

Table 7. Distance education according to gender criteria

	Gender	N	M	SD	Df	t	p
Distance Education Situations	Male	265	4.40	0.19	520	-590	.532
	Female	255	4.34	0.24			

The distance education status of the students according to the gender variable was examined and it was found that there was no significant difference according to the gender criterion. [$t(520) = -590, p < .05$]. When the distance education status of university students is examined, it is seen that male students have an average score in this field ($M=4.40$) while female students have an average score in distance education ($M=4.34$). In this context, it can be said that there is no difference between the distance education scores of male students in this study compared to female students in the findings of the research part of the dec.

3.4 Distance education situations according to the department criteria

In this section, the use cases of distance education according to the department criteria were examined and detailed findings were given in Table 8.

Table 8. Distance education situations according to the department criteria

Department	N	Rank Average	SD	X ²	P
Computer engineering	424	81.54	3	1.780	.120
Electrical engineering	82	15.77			
Mechanical Engineering	14	2.69			

There is no significant difference between the results of comparing the distance education status of university students according to the department criteria. ($\chi^2(3) = 1.780; P = .120; P > 0.05$). When the distance education results of university students are considered according to the department criteria, it is seen that the computer engineering range is the highest, the second highest value is seen to be in the electrical engineering range, and finally the mechanical engineering range is found. It can be said that there

is no significant difference between the distance education status of the university students regarding the department criteria.

4 Discussion

Chakraborty and colleagues (2021) expressed their views on different aspects of online education to undergraduate students in Indian universities sought to determine, and as a result of college students that are used to support online education software and online study materials, they have concluded that they found they liked and meaningful, in this context, when the results of the study and this value were combined, it was decided that university students liked the system in distance education and felt happier online between the results of the study [10]. The results are similar among the studies, it is seen that distance education systems provide benefits and benefits to university students. It can be said that the model and group are very important for distance education studies to always benefit university students.

Ozer and colleagues (2020) in the year of distance education in the educational process of students on the work they have done assessments and recommendations, identify, and sought to develop recommendations for the solution of the problems, and as a result, web-based distance education courses, practical face to face training is not as efficient, in particular, have reached the conclusion that there is connectivity and technical problems experienced during the course [15]. In this context, we see that distance education is not useful in this research, when this study is combined with the results of the research, it is seen that the results of the research are opposite by decided that the distance education system benefits students, in this context, one study shows a positive result while the other study shows a negative result, as a negative result, it is known that research always benefits and benefits in the given problem situation, in this context, it is expected that the research will determine the problem situation well and will appeal well to university students or the audience to be applied. It is thought that this study and the study of the research will be examples of other studies.

Syauqi and the guys (2020) in their work on COVID-19 for mechanical engineering college students as a result of the impact of the pandemic education has attempted to provide an overview of the perceptions of online learning and, as a result, they mastered the competencies of students and students ease of access to online learning resources at being that they have achieved a better experience [22]. In this context, according to the results of the research, it has been concluded that the distance education status of engineering students is high compared to e-exam applications and other dimensions [17]. According to these results, it is seen that some studies on distance education have shown a positive result, while some studies have shown a negative result, but the result is the result and it is known that it will benefit future research [18]. One dimension of this research is that it is thought to shed light on future studies, it is expected that 520 students will participate in the study and give a positive result, which will also benefit future university students.

5 Conclusion

Data regarding the results of the study will be included in this section, the results of the research are discussed, it is seen that when the number of students participating in the first survey of the research, problem statement and model due to the number is of considerable importance, accordingly 520 has reached the conclusion that college students participated in the research. Another result of the research is to determine the amount of daily usage in the time zone which the smart device, especially with the pandemic in the era of smart devices to keep up with their education and increase the number of students use their smart device to smart device usage in this context it is very important for college students and up to 8 hours of daily use as over the results that have been achieved, this data can be said to be quite good for training. Another important result of the study distance education of university students in the process that they use on a daily basis and use cases related to the time of the pandemic in the process of distance education were examined daily for up to 8 hours college students use as the amount of Use and the results that have been achieved over data use cases, it is fair to conclude that your smart device that supports university students in education with distance education as a result of these efforts can be said that they did not come back.

Always indicate the importance of research in view of changing the shape of the dimensions of the proposed research is that, in this context, according to the statistical results regarding their opinions Distance Education University students, distance education of university students into the system they can access from any device they want, they want what you know to find the data through the distance education system, Remote education system, when they enter the system useful to find all the materials they provide access to distance education through the system, It is seen that there are no problems with the e-exam application on the Distance Education system and that the results have been achieved. In addition, it has been found that university students have a high level of predisposition to distance education systems, they can share files via a distance education system, they can enter a distance education system from any device, and their results have been reached. In this context, it can be said that the distance education status of university students is very good.

Another vision of the results of research on the college students' opinions regarding their environments Zoom Video Conferencing Zoom video conferencing applications of the statistical results in the results they bring in college students devote more time to take courses in addition to courses in and Zoom video conferencing application with them anytime, anywhere you can learn, zoom, a video conferencing environment to be able to use the feature while taking the course in chat, Live in a tutoring environment, of course they have not had any disconnected during the processing, in addition, they did not experience a disconnect in their live lessons about Zoom video conferencing environments, they were able to attend their live lessons anywhere and anytime with Zoom Video Conferencing, they enjoyed messaging with their friends in the Zoom Video Conferencing application, and positive good results were achieved.

Another result of the research is that the distance education status of university students according to the gender variable was examined and it was concluded that there was no significant difference according to the gender criterion. In this context, it can be

said that there is no difference between the distance education scores of male students and female students in this study in the results dec of the study. In addition, it is seen that there is no significant difference between the results of the research and comparison of the distance education dec of university students according to the department criterion. In this context, thanks to this wide participation, results have been obtained that will explain the Covid-19 process related to distance education in a good way. In general, it has been concluded that students are happy to see the distance learning model in their courses, so that they do not lag behind in their education, university students monitor their courses mostly with the help of smart devices.

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