

# Distance education during social isolation: an evaluation of student attitudes and perceptions using the web-based learning environment instrument (WEBLEI)

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## Abstract

**Objectives:** Until recently, distance education at universities has supplemented face-to-face education in blended programs that combine the two. But during the COVID-19 pandemic in the spring of the 2019–2020 academic year, many universities were forced to conduct distance education exclusively. The aim of this study is to determine the perceptions, thoughts, and experiences of university students regarding the completely online process of distance education during this period.

**Methods:** In this process, all theoretical lessons and exams were conducted on the advance learning management system (ALMS) for distance education at İstinye University. The present study used the original form of WEBLEI to survey 324 students from medicine, pharmacy and health science departments at İstinye University.

**Results:** WEBLEI measures students' perceptions using four scales: access, interaction, response and results. Though students did not experience problems accessing online lessons or interacting with their teachers and other students, they did not find online distance education alone more effective and satisfying than combined with face-to-face education.

**Conclusion:** This study contributes to a better understanding of the pros and cons of distance education by evaluating the attitudes and perceptions of university students.

**Keywords:** distance education; online lessons; social isolation; WEBLEI; web-based learning

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## Introduction

Distance education is an educational method that does not require students to attend school lessons physically.<sup>[1]</sup> It may be seen in hybrid (blended) programs that combine online education courses with face-to-face education courses or it may appear alone as online education courses.<sup>[2]</sup> Web-based learning is defined as a form of distance education which uses computer and internet technology.<sup>[3]</sup>

Universities prefer distance education more commonly than in the past, but there are still conflicts about distance education at universities, and educators have some doubts about its effectiveness.<sup>[4]</sup> Many studies have shown the benefits of distance education for both schools and students. Singh<sup>[5]</sup> remarked that hybrid lessons offer stu-

dents better learning experiences and are more effective than classroom-based lessons alone. Young<sup>[6]</sup> supported the idea that offering various materials to students maximizes student engagement since not all students learn in the same way. A study at the University of Wisconsin (Milwaukee, WI, USA) showed that students learn better in hybrid education programs compared to face-to-face education alone. Teachers responsible for the hybrid education program at the university reported that students wrote better papers, got higher marks, produced more quality projects, and discussed lessons more meaningfully.<sup>[7]</sup> Dantas and Kemm<sup>[8]</sup> showed a high positive correlation between distance education lessons and students' final exam results. Joynes and Fuller<sup>[9]</sup> remarked that distance education, with the advancement of technology, allows

students to attend classes from anywhere with an internet connection. Kirtman<sup>[10]</sup> maintained that distance education offers students opportunities that face-to-face education cannot offer, stating that distance education enables students to listen again to what they could not understand well during the lesson. Distance education also benefits universities. The hybrid education may enable universities to reduce the number of overcrowded classes, which allows universities to make more classes available even at peak demand times of the day.<sup>[11]</sup>

Despite its advantages, distance education has its critics. Students may lack adequate technologic infrastructure and proper training to use a distance education system correctly, which may cause them bad experiences in the distance education process.<sup>[12]</sup> One study has argued that social isolation during the distance education process and lack of social interaction reduces the educational success of students and prevents them from developing socially.<sup>[5]</sup> Green and Whitburn<sup>[13]</sup> stated that face-to-face education is of a higher quality than distance education, particularly in terms of experimental learning, and indicated that students do not value distance education as much as face-to-face education. Courses offered only online were not perceived by students to be as successful as face-to-face courses.<sup>[14,15]</sup>

SARS-Cov-2 is a coronavirus that causes a severe acute respiratory syndrome in humans. It was first identified in December 2019 in China and thereafter spread rapidly to other countries.<sup>[16,17]</sup> The World Health Organization (WHO) declared COVID-19 infections worldwide a pandemic in March 2020, forcing governments across the world to take precautions against the further spread of the disease; one such precaution was to close university campuses, and many universities elected to continue to their courses online.

Though many studies have shown the benefits of distance education, deficiencies are also clearly visible and these increase the pandemic anxiety of university students.<sup>[18,19]</sup> This study aims to determine students' attitudes and perceptions regarding lessons delivered via distance education in the pandemic period. We surveyed medicine, physiotherapy/rehabilitation, nutrition/dietetics, and pharmacy students because of the prevalence of practical lessons in their syllabi and the many practical lessons these students missed. Our study included a total of 324 students enrolled at İstinye University who participated in distance education during the pandemic. All participants completed the web-based learning environment instrument (WEBLEI).

## Materials and Methods

The literature contains studies that evaluate and compare the advantages and disadvantages of distance education to those of face-to-face education using various surveys. After reviewing the literature, the researchers decided to use the WEBLEI for this study. Developed by Chang and Fisher,<sup>[20]</sup> the WEBLEI is a multidimensional construct that assesses student perceptions of four core aspects of the Web-based learning environment: access, interaction, response and results. After obtaining permission from the survey owner, our study used the survey to evaluate student attitudes and perceptions of distance education during the pandemic.

A total of 324 students (231 female, 93 male) at İstinye University from the departments of medicine, pharmacy and health science participated in the study. The departments of the students participating in the study are shown in **Table 1**.

The survey was sent to first- and second-year students in health-related departments; departments providing instruction in English were preferred. Participation in the study was voluntary. Participation rates in the courses was not considered because students could take courses online or offline using the ALMS platform. The demographic characteristics of the students are presented in **Table 2**.

At İstinye University, all theoretical lessons and exams that could not be conducted face-to-face in the spring of 2020 due to the COVID-19 pandemic were given online via the advanced learning management system (ALMS) for distance education. In this process, the distance education system implemented the content of the face-to-face education lessons. Study participants received online lessons through the "ALMS" and "Perculus plus" software systems. For online lessons, students and lecturers needed a computer, tablet, or mobile devices with camera features. The duration of each lesson was limited to a maximum of 50 minutes. A message ("chat") box on the lesson screen permits students to share their questions or problems with lecturers and other students. Online lessons are

**Table 1**

Distribution of students according to their departments.

Faculty/Department	Frequency
Faculty of Medicine	55
Faculty of Pharmacy	154
Faculty of Health Sciences / Department of Physiotherapy and Rehabilitation	92
Faculty of Health Sciences / Department of Nutrition and Dietetics	23
Total	324

**Table 2**

Frequencies and relative percentages of demographic characteristics.

Demographic Characteristics		Frequency			
		Faculty of Medicine	Faculty of Pharmacy	Department of Physiotherapy and Rehabilitation	Department of Nutrition and Dietetics
Gender	Female	38	104	66	23
	Male	17	50	26	-
Age (in years)	18-22	52	137	84	22
	23-26	3	17	8	1
Grade	1st	46	146	56	15
	2nd	9	8	36	8

automatically recorded and later published, so students can watch them after the lesson concludes.

For the purposes of the study, survey questions were uploaded to the Internet via Google Forms. The candidates consented in writing to participate in the study before beginning the survey. After giving their approval, they were allowed to access the survey questions via a link to the web page containing the questionnaire. After the distance education program was implemented for the COVID-19 period, the survey was conducted from 22.07.2020 to 29.07.2020.

This study used the WEBLEI<sup>[20]</sup> to collect data on student perceptions of their web-based learning experience. The WEBLEI measures student perceptions along four scales: access, interaction, response, and results. All four scales include necessary components for student success in a teaching and learning environment. In this study, WEBLEI scales were unchanged and used in their original forms.

The WEBLEI survey contains a total of 32 items, with eight items along each scale. The answers to the items in the scales include: almost always (5), often (4), sometimes (3), seldom (2), and almost never (1). The 'access' scale measures the accessibility of the learning environment to students; this scale aims to learn how well students adapt to their learning environment. The 'interaction' scale investigates how beneficial students judge distance education to be; through this scale, students evaluate the quality of the interactions amidst their classmates, lecturers, and themselves. The 'response' scale indicates how students feel and think about the web-based learning system. The 'results' scale expresses the extent to which students believe they accomplished any of the learning objectives within the online learning environment.<sup>[19-21]</sup>

The data was analyzed using Statistical Package for Social Sciences (SPSS Version 24, Armonk; NY, USA). A

parametric Student's t-test compared two independent groups of students, and parametric ANOVA test compared more than 2 groups. Bonferroni was used as the post-hoc test. Quantitative data was expressed in the tables as mean  $\pm$  standard deviation and median (minimum-maximum) values, and categorical data was expressed in n (number) and percentages (%). The data was analyzed in the 95% confidence interval, p-value was considered as significant if less than 0.05.

## Results

Results of the study have been presented using the scales and items of WEBLEI. The WEBLEI contains four main scales, each including eight questions. Students' emotions, experiences, and thoughts about the accessibility of distance education lessons, the interaction between students and teachers during the distance education period and the process of the distance education method were obtained through the questionnaire items. The participants were students in the health sciences departments at İstinye University and all completed the questionnaire in its entirety. Participants' answers were evaluated without regard to their different faculties. Means of 3.32, 3.37, 2.75 and 3.00 were obtained for access, interaction, response, and results scales (Table 3). Questionnaire items and results of the scales are shown in Table 4.

**Table 3**

Weighted means, median and standard deviation for the four scales of the WEBLEI

WEBLEI scales	Mean	Median	Standard deviation
Scale I- Access	3.32	3.50	1.02
Scale II- Interaction	3.31	3.37	0.93
Scale III- Response	2.75	2.62	1.04
Scale IV- Results	3.00	3.00	1.07

**Table 4**  
Questionnaire items and scale results.

	Almost never		Seldom		Sometimes		Often		Almost always		M	Mdn	SD
	n	%	n	%	n	%	n	%	n	%			
<b>I. Questionnaire items of access scale</b>													
I can access lessons on the Internet at time convenient to me	19	5.86	46	14.19	68	20.98	111	34.25	80	24.69	3.57	4	1.17
Lessons on the Internet are available at locations suitable for me	25	7.71	27	8.33	52	16.04	132	40.74	88	27.16	3.71	4	1.17
I can access lessons on the Internet on days when I am not class or absent from school	33	10.18	25	7.71	32	9.87	123	37.96	111	34.25	3.78	4	1.27
Lessons on the Internet allow me to work at my own pace to achieve learning objectives	54	16.66	63	19.44	75	23.14	68	20.98	64	19.75	3.07	3	1.36
Lessons on the Internet enable me to decide how much I want to learn in a given period	44	13.50	59	18.20	91	28.08	70	21.60	60	18.51	3.13	3	1.29
Lessons on the Internet enable me to decide I want to learn	55	16.97	54	16.66	75	23.14	92	28.39	48	14.81	3.07	3	1.31
The flexibility of lessons on the Internet allows me to meet my learning goals	54	16.66	49	15.12	86	26.54	73	22.53	62	19.13	3.12	3	1.34
The flexibility of the lessons on the Internet allows me to explore my own areas of interest	50	15.43	63	19.44	80	24.69	72	22.22	59	18.20	3.08	3	1.32
<b>II. Questionnaire items of interaction scale</b>													
I communicate with my teacher in this subject electronically via email	36	11.11	61	18.82	76	23.45	103	31.79	48	14.8	3.20	3	1.22
In this learning environment, I have to be self-disciplined in order to learn	27	8.33	19	5.86	51	15.74	109	33.64	118	36.41	3.83	4	1.21
I have the option to ask my teacher what I do not understand by sending an email	27	8.33	49	15.12	91	28.08	90	27.77	67	20.67	3.37	3	1.20
I feel comfortable asking my teacher questions via an email	37	11.41	55	16.97	84	25.92	81	25	67	20.67	3.26	3	1.27
The teacher responds to my email	29	8.95	56	17.28	96	29.62	90	27.77	53	16.35	3.25	3	1.18
I can ask other student what I do not understand during computer lessons	39	12.03	47	14.50	77	23.76	104	32.09	57	17.59	3.28	3	1.25
Other students respond positively to questions in relation to Internet lessons	32	9.87	43	13.27	101	31.17	86	26.54	62	19.13	3.31	3	1.20
I was encouraged by the positive attitude of my friends towards the Internet lessons	53	16.35	59	18.20	105	32.40	58	17.9	49	15.12	2.97	3	1.27
<b>III: Questionnaire items of response scale</b>													
This mode of learning enables me to interact with other students and my teacher	88	27.16	94	29.01	64	19.75	48	14.81	30	9.2	2.50	2	1.28
I felt a sense of satisfaction and achievement about this learning environment	76	23.45	87	26.85	61	18.82	52	16.04	48	14.81	2.71	2	1.37
I enjoy learning in this environment	94	29.01	58	17.90	60	18.51	46	14.19	66	20.37	2.79	3	1.50
I could learn more in this environment	98	30.24	74	22.83	50	15.43	45	13.88	57	17.59	2.65	2	1.47
I can easily get students to work with me on the Internet	80	24.69	82	25.30	70	21.60	53	16.3	39	12.03	2.65	2.5	1.33
It is easy to work with other students and discuss the content of the lessons	82	25.30	77	23.76	65	20.06	64	19.75	36	11.11	2.67	3	1.33
The web-based learning environment held my interest in this subject throughout this term	84	25.92	60	18.51	75	23.14	61	18.82	44	13.58	2.75	3	1.37
I felt a sense of boredom in this subject towards end of this term	40	12.34	48	14.81	85	26.23	72	22.22	79	24.38	3.31	3	1.32
<b>IV: Questionnaire items of result scale</b>													
I can work out exactly what each lesson on the Internet is about	47	14.50	66	20.37	87	26.85	74	22.83	50	14.43	3.04	3	1.27
The organization of each lesson on the Internet is easy to follow	40	12.34	54	16.66	59	18.20	96	29.62	75	23.14	3.34	4	1.32
The structure of the lessons on the Internet keeps me focused on what is to be learnt	52	16.04	74	22.83	74	22.83	73	22.53	51	15.74	2.99	3	1.31
Internet lessons helped me better understand the work that was taught in class	82	25.30	77	23.76	57	17.59	54	16.66	54	16.66	2.75	3	1.42
Lessons on the Internet are well-sequenced	42	12.96	46	14.19	83	25.61	91	28.08	62	19.13	3.26	3	1.28
The subject content is appropriate for delivery on the Internet	76	23.45	67	20.67	62	19.13	64	19.75	55	16.97	2.86	3	1.41
The presentation of the subject content is clear	68	20.98	60	18.51	68	20.98	81	25	47	14.50	2.93	3	1.36
The multiple-choice test at the end of each lesson on the Internet improves my learning in this subject	63	19.44	67	20.67	85	26.23	63	19.44	46	14.19	2.88	3	1.31

\*All questionnaire items were responded by all participants (324 students). M: Mean; Mdn: median; SD: standard deviation.

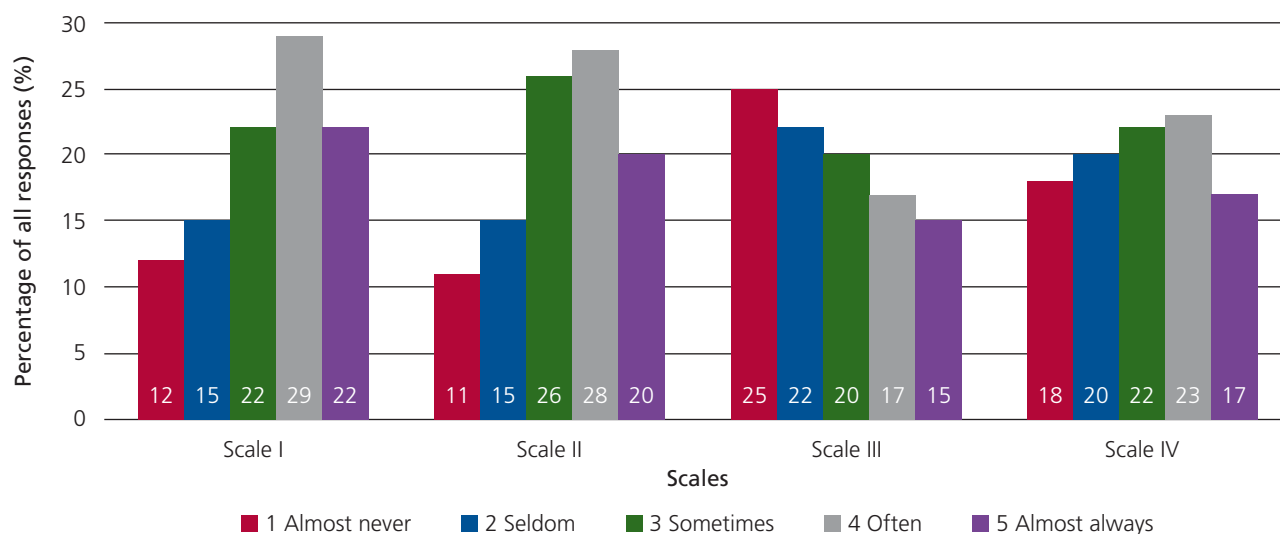
The first scale of this questionnaire concerns accessibility of distance education lessons via internet connection. This scale evaluated the convenience of online lesson times and locations for students and the effects of online lesson flexibility on students' learning processes. Many participants remarked that online lessons permitted access at any time ( $M=3.57$ ) and any location ( $M=3.71$ ). The access scale suggested that the online learning environment allows access to lessons even when students are not in class or absent from school ( $M=3.78$ ). However, percentage about students deciding how much they learn and what they learn on the online lessons is close to each other. Moreover, the answers regarding the flexibility of the lessons on the internet for the realization of learning goals and the exploration of their own interests were close to each other. The median response to questions related to contribution of online courses to student learning goals and achievements was 3. While some students agreed that these lessons met their learning goals and allowed them to explore their areas of interest, some of them have strongly disagreed. As a result, not all the students shared the same idea about their educational attainment. In a comparison of departments, statistically significant differences were seen between Physiotherapy/Rehabilitation ( $M=2.91$ ) and Medicine ( $M=3.75$ ) / Pharmacy ( $M=3.37$ ) / Nutrition ( $M=3.44$ ) ( $p<0.001$ ).

The interaction scale is associated with the student experience of communication within distance education. Participants indicated that they often contacted their teachers electronically via email ( $M=3.20$ ). There are other platforms where students communicate with their teachers besides e-mail, but the interaction scale specifically asks about communication established via e-mail. Students stated that they were able to communicate with their teachers easily and conveniently via e-mail. Further, they remarked that their teachers sometimes responded to their emails ( $M=3.25$ ). Participants liked email as a means of communicating about lesson content they did not understand, and they generally felt comfortable asking their teachers questions via email ( $M=3.26$ ). A high percentage of the students chose 'often' and 'sometimes' options regarding their communication with other students. The majority of students thought they could ask other students questions during online lessons ( $M=3.28$ ); some students responded positively to questions in relating to online lessons ( $M=3.31$ ). Further, the majority of students indicated that self-discipline was necessary in the online learning environment ( $M=3.28$ ).

The response scale posed questions relating to student satisfaction in the online learning environment. A high percentage of the participants did not think that the

online learning model allows them to interact, work and discuss the content of the lessons with other students. Furthermore, the majority of participants had negative impressions of learning in this environment. The majority of them replied they 'almost never' enjoyed learning in this environment ( $M=2.79$ ). Likewise, students thought they could not learn more in this environment ( $M=2.65$ ) and many did not feel a sense of satisfaction or achievement in this learning environment ( $M=2.71$ ). They indicated that they found this education model boring ( $M=3.31$ ) and the online learning environment did not hold their interest in throughout this term ( $M=2.75$ ). Statistical analysis showed that the mean answer for the second-grade students ( $M=2.44$ ) is significantly lower than the first-grade students ( $M=2.83$ ) in this scale ( $p=0.009$ ).

The result scale, the last part of the questionnaire, included questions about the organization and content of the lessons on the internet. Study results indicated the participants believed they could sometimes figure out completely what each lesson online was about ( $M=3.04$ ). While the organization of each lesson online was easily followed by many participants ( $M=3.34$ ), the majority did not think that lessons online helped them understand the subject better than lessons in the classroom ( $M=2.75$ ). In addition, the students did not all share the opinion that online lessons kept them focused. When asked about content presentation, a high percentage of the students thought that content was not appropriate to online delivery ( $M=2.86$ ). Many participants stated that course content and presentation of information were not effectively delivered online ( $M=2.93$ ). In the distance education program, multiple-choice tests and other types of exams were given to students at the end of each lesson or at the end of the term. The lowest percentage of the participants believed that multiple-choice tests at the end of each lesson online always facilitated learning, but the highest percentage of the participants believed that multiple-choice tests at the end of each lesson online 'sometimes' facilitated learning ( $M=2.88$ ). In this scale, there were statistically significant differences among departments, gender, and grades. Statistically significant differences were seen in comparing the Physiotherapy/Rehabilitation departments ( $M=2.58$ ) and both Medicine ( $M=3.46$ ) / Pharmacy ( $M=3.07$ ) / Nutrition ( $M=3.17$ ) departments ( $p<0.001$ ). The average mean for the female students ( $M=3.11$ ) is significantly higher than the male students ( $M=2.76$ ) along this scale ( $p=0.008$ ); and the mean for the second-grade students ( $M=2.56$ ) is significantly lower than the first-grade students ( $M=3.12$ ) ( $p<0.001$ ). The results of all the scales are shown in **Figure 1**.



**Figure 1.** The four scales of the WEBLEI: student responses.

## Discussion

The popularity of distance education has increased, especially in the undergraduate and postgraduate context. The COVID-19 pandemic has shown implementation of distance education to be accelerating and in need of focus.<sup>[21]</sup> This questionnaire study examines student perceptions about distance education during the COVID-19 pandemic.

Distance education has numerous undisputed advantages, including student access to lessons and course materials at any time with an internet connection.<sup>[4]</sup> Joynes and Fuller<sup>[9]</sup> remarked that distance education, with the advancement of technology, allows students to attend classes from anywhere with an internet connection. Sheryl et al.<sup>[22]</sup> maintained that the learning environment was easily accessible in time and space for students. This study's access scale results support the findings of Sheryl et al.<sup>[22]</sup> and Joynes and Fuller.<sup>[9]</sup> Yet participants in this study had mixed views about the success of online lessons in helping them realize their learning goals and develop their interest areas. Although accessing lessons at any time and location offers clear advantages, distance education alone is not sufficient to meet the learning goals and interests of students. According to the significant differences seen in comparing the Physiotherapy/Rehabilitation and Medicine / Pharmacy fields along the access scale, it is possible to conclude that physiotherapy students have difficulty accessing their courses. It may be that these students had adaptation and motivation problems during the distance education period.

Students were able to contact with their teacher via communication options such as online chat, videoconfer-

encing during class. When they needed to get in contact with their teacher for extracurricular questions during face-to-face education, they could ask them face-to-face; but students had only e-mail in the ALMS platform or personal e-mail accounts to access their teachers during distance education. WEBLEI's interaction scale (and the interaction scale of this study) specifically examines this method of communication between students and teachers. Dyrbye et al.<sup>[23]</sup> has stated that lack of face-to-face communication between students and lecturers negatively affects the clarity of instructions and the quality of the feedback. Although they generally agreed that web-based learning gave them an opportunity to contact their teachers and other students, students stated that they did not completely feel comfortable communicating in this way. The interaction scale of other studies using WEBLEI showed similar results.<sup>[22]</sup> Horzum<sup>[24]</sup> suggested that students who cannot adapt technologically to distance education have learning problems. Instructing both students and lecturers on how to interact on distance education platforms could positively affect student responses along the interaction scale.

The response scale included questionnaire items relating to student satisfaction surrounding the learning environment. In this study, the response scale was rated the lowest ( $M=2.75$ ). The results show the participants generally gave negative responses. Undergraduate students did not generally find web-based teaching in the COVID-19 pandemic period to be satisfactory and enjoyable; they did not feel successful during this learning period and did not find it easy to work with other students online. On the contrary, Ilahi et al.<sup>[25]</sup> stated that postgraduate students were

satisfied and enjoyed the learning process and working with other students in a blended learning environment. Chandra and Fisher<sup>[26]</sup> revealed that students generally agreed that web-based learning was satisfactory. While Chandra and Fisher<sup>[26]</sup> reported that the highest rating item for the response scale is “I enjoy learning in this environment” ( $M=4.15$ ), the rate is 2.79 for our study. The results showed that although students were generally satisfied in a blended learning environment, they were not satisfied when the education process was completely online and distanced. It can be concluded that although students like the fact that online learning is included along with face-to-face education, they are not satisfied taking all their lessons online. First and second-grade health-related faculties have course intensities and they have also theoretical and practical course differences. In our study, the scale mentioned above was used to question whether these factors affect the education model. Moreover, the weighted mean of first grade was significantly higher than the second grade in the response and result scale. Second-grade lessons were more intense than first-grade lessons in the health sciences departments. Thus, the weighted mean of first grade was significantly higher than the second grade in the response and result scales. All practical courses had to be conducted only on the ALMS platform, rather than in a laboratory or internship environment, so this situation may be due to student perception. Horzum<sup>[24]</sup> stated that problems during the learning process can arise when practical lessons are conducted online. In our study, it is possible to report that second-grade students were not as satisfied as first-grade students with web-based learning due to the increasing intensity of their lessons, especially practical ones.

The results scale contains questions related to student perceptions about the structure, design, and content of the learning objectives. In this study, students stated generally that although they followed lessons easily and found the lessons well sequenced, they did not totally agree that the course content and presentation of information were best delivered online. This is dissimilar to other studies' findings that content and presentation of information were appropriate for distance education.<sup>[22]</sup> The result scale's mean score for Physiotherapy/Rehabilitation is significantly lower than Medicine and Pharmacy, reflecting that physiotherapy students had difficulty adjusting to the distance education platform compared to the students in the other health faculties. In this study overall, the means of the four scales for the medicine students are the highest of all the departments. The reason for this significant difference is likely the motivation and adaptation of medical students and the academic staff during the pandemic period. Furthermore, future comprehensive studies are needed to

address the comparisons between face-to-face and distance education with different methods in various departments due to differences in course intensity and contents among the departments.

## Conclusion

The COVID-19 pandemic has forced universities to conduct the education through online platforms. Distance education has advantages and disadvantages and there are conflicts among educators and students regarding distance education.<sup>[4]</sup> During the pandemic period, some pros and cons of distance education have been clearly realized. The COVID-19 pandemic period has shown that distance education platforms are needed and must continue to develop and evolve. This study identified student perceptions about distance education during the COVID-19 pandemic period and suggested that some aspects of distance education platforms need to improve. When online lessons are the only option, students should not be left thinking that online lessons are less effective and satisfying than face-to-face lessons. The COVID-19 pandemic period proved that educational institutions should always be prepared to conduct education using complete distancing.

## Conflict of Interest

The authors declare that they have no competing interests.

## Author Contributions

ID: manuscript writing/editing; SA: manuscript writing/editing; BA: data collection and data analysis; İD: protocol/project development; KÇK: manuscript writing/editing; İD: data analysis.

## Ethics Approval

Approved by İstinye University's Social and Human Sciences Research Ethics Committee, meeting number 2020/9 (decision number 05; date:20.07.2020).

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