Evaluation of Online Education Delivered by the Universities During Pandemic COVID-19: A Case of North Cyprus

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Abstract
Universities skipped from face-to-face education on campuses to online education worldwide due to the outbreak of COVID-19 started in December 2019. But it remains unclear how effective online education was, given that most instructors and students had little experience with online education and with lack of technological resources. This study aimed to evaluate the online education offered by the universities during Pandemic COVID-19. Mixed research was conducted with randomly selected 500 university students and 24 instructors from various universities in North Cyprus between April 2020–August 2020. Students agreed with the 30 benefits of online education, and they stated serious obstacles that they faced during online lectures. Instructors mentioned their online teaching experiences and the obstacles they faced during the pandemic. Also, participant instructors made some suggestions for the government, universities, and instructors to improve and ensure the effectiveness of online education. This type of in-depth research can be carried out by all universities globally and the data will help all education leaders and management of the universities to determine the weak and strong points of their online education and re-manage and redesign their online education to meet the needs of students. Universities can produce solutions to mitigate their problems in online education and increase the quality of online education which can be accessed by all students.
Keywords: Education Management; Higher Education; Instructors; Online Education; Pandemics; Students; Total Quality Management;

Introduction

There is an ongoing global outbreak known as COVID-19 caused by SARS-CoV-2, a new strain of coronavirus that causes some types of the common cold and Severe Acute Respiratory Syndrome (SARS). COVID-19 was first identified in Wuhan, China in December 2019, spread to 188 countries and territories. The outbreak of COVID-19 has been declared a Public Health Emergency of International Concern (PHEIC) and it continues to spread without differentiating between borders, age, gender, ethnicities, or disability status. Although many of the symptoms can be treated and there are several clinical trials that are being conducted to evaluate potential therapeutics for COVID-19 (Unicef,2020).

The outbreak of COVID-19 has caused social, economic disruption and affected education highly by impacting approximately 98.6% of the student population of the world. Schools, colleges, and universities have been closed in 161 countries (Unesco,2020) to prevent the spread of COVID-19. School closures have affected not only the students and teachers but also families worldwide. School closures have impacted over 60% of the student population of the world by resulting in some disruptions in education. COVID-19 outbreak has interrupted learning of students, caused poor nutrition of students who rely on healthy and free meals provided at schools, struggling of parents to facilitate the learning of their children at home, challenges of creating, maintaining, and improving distance learning, increased pressure on schools to remain open, rise in dropout rates and challenges in measuring and validating learning due to postponing or skipping calendered assessments and high-stake examinations (Unesco,2020). Online education was very ineffective in most of developing and underdeveloped countries (Adnan & Anwar,2020). It is a fact that teachers have had to adapt to universal distance education, but

there is a reality that most teachers and their organizations lack the skills and equipment to provide distance education effectively (International labor organization,2020). Many digitally developed countries have made different effective attempts and successful delivery of online classes to their students(Basilaia & Kvavadze, 2020; Zhou et al.,2020). In some developing and well-developed countries, schools followed alternative learning pathways after a short-break such as homeschooling, TV programs, radio programs, or other types of online learning. Many countries have turned to distance education to mitigate the loss of learning by using different teaching strategies. Schools in China, Italy, France, and Germany have delivered education to the students fully online and mobile phones or televisions have been used in Vietnam and Mongolia. Other countries such as Lebanon sent students home with lessons as homeworks; the government in Bulgaria created over 800,000 accounts for all teachers and parents, and publishers opened their digital textbooks and learning materials for students in grades 1 to 10 (Azzi-huck and Shmis, 2020).

During the COVID-19 crisis, all the universities closed their campuses temporarily with the order of the government to prevent to spread of COVID-19 in mid-March 2020 in North Cyprus. Most of the students returned to their home countries. After a 15-day break, the universities skipped from face-to-face education on campuses to online education. Instructors offered different types of online education to their students, such as synchronous or asynchronous, by using different online learning platforms from March 2020 to the end of June 2020. Some universities offered online courses as a summer school from June 2020 to the end of August 2020. Most of the students experienced online education without previous knowledge. Some instructors had prior experience with online education, but the others received help from technology teams in their universities and learned how to teach online in two weeks. Education is one of the top priorities now and the quality management of education during and after the outbreak crisis is urgent. Policymakers and educational administrators may use the COVID-19 outbreak crisis as an opportunity to introduce new learning modes that can reach every student and to prepare for emergencies (World bank,2020). Online education becomes more prominent in higher education and needs more attention and adequate investments of institutions, instructors, and students (Bao,2020).

Focus on expectations of stakeholders of education and their involvement in continuous development (Sallis, 2002; Al-Ibrahim, 2014; Bunglowala and Asthana, 2016), identifying needs and expectations of students about the quality of school services (Gruber et al., 2010) and high service quality delivery (Ene and Tatar, 2010 ; Militaru et al., 2013; Sweeney, 2016; Senol and Daglı, 2017) of institutions are the key principles of Total Quality Management in education. Educational institutions that provide quality services will achieve higher success, and they will be preferred if they design their programs to meet the needs and expectations of their students (Demirtaş & Kahveci, 2010). Schools should concern with the quality delivery of online education to support and advance the 21st-century skills of their students. It is time to share the experiences and take the opinions of the main stakeholders of education-students and instructors to learn what worked well and what didn't and reorganize online teaching to ensure the quality of learning in safe environments as a priority of the quality management of education. A few recent research analyzed the challenges and also the opportunities of e-learning during Pandemic COVID-19 (Mailizar et al., 2020). Some researchers emphasized the advantages of online learning experienced by the students during Pandemics, and some mentioned the problems faced by the students and teachers. Future in-depth research studies into online education are needed, especially concerning students (Zhang,et al.,2020) to explore the challenges of online education that hinder students' achievement (Mailizar et al., 2020) and the quality of online learning (Basilaia & Kvavadze, 2020). Based on the data, universities may detect their deficiencies in online education and speed up reform of online education by designing innovative course content, efficient management, and state-of-the-art technology (Sun et al.,2020).

Research Methodology

Aim of the research

This research aimed to evaluate the online education delivered by the universities during Pandemic COVID-19 in North Cyprus. In this light, answers to the research questions were sought:

RQ1: What are the perceptions of the students about the benefits of online education?
RQ2: What are the obstacles faced by the students during online learning?
RQ3:Which online platforms did the instructors use during the Pandemic?
RQ4: Which type of online education did the instructors offer during the Pandemic?
RQ5: Which type of adaptations did the instructors make in course content and duration of the course?
RQ6: Which strategies did the instructors use to motivate their students and increase student engagement?
RQ7: How did the instructors evaluate the online learning of their students?
RQ8: Which online resources did the instructors use?
RQ9: What are the obstacles faced by the instructors?
RQ10: What are the suggestions of the instructors to increase the efficiency and quality of online education?

Sample
Randomly selected 500 university students and 24 university instructors of various universities in North Cyprus were the participants of this study. For the students included in the sample, researchers also examined the background features such as the gender (59% male, 41% female), age (52.2% between 21-26, 40.6% between 26-30, 5.8% between 31-35, %1 between 36-40 and 0.4% between 41-45), department (health sciences-29.6%, sports sciences-18.6%, psychology-16.8%, engineering-13.8%, dentistry-8.8%, mathematics-4%, pre-school teaching-3.8%, economics-2.8%). Also, background features of the instructors were examined by the researchers such as gender(62.5% female, 37.5% male), age (12.5% between 41-45, 37.5% between 46-50, 25% between 51-55, 25% 56 and over), teaching experience (25% between 16-20, 37.5% between 21-25 and 37.5% between 26 and over), type of university (62.5% private, 37.5% state), departments (sports sciences-12.5%, psychology-12.5%, educational administration-37.5%, biomedical engineering-12.5%, English literature- 12.5%, mathematics-12.5%) and in-service training about online education before Pandemic (25% yes, 75% no).

Research Model
Researchers conducted a case study and mixed methods of design comprising both quantitative and qualitative parts in this study. Researchers prepared two surveys: survey 1 and survey 2.

Data Collection
Research data were collected between April 2020–August 2020 in the 2019-2020 Spring term.

Survey 1
For the quantitative part of the study, literature about online education before and during COVID-19 was examined. Based on the data obtained, survey 1 comprising three parts was prepared: The first part of survey 1 consists of the questions to find out the demographic features of the students. The second part of the survey consists of a pool of 43-items with 5-Likert type responses (1-*strongly agree*, 2-*agree*, 3-indecisive, 4-dis*agree*, 5-*strongly disagree*) to determine the perceptions of the students about the benefits of online education that they received during Pandemic.The third part of survey 1 comprises one semi-structured question: What are the obstacles faced by the students during online courses?. To ensure the content validity of the survey, the opinions of three field experts were received about the usefulness of the survey, directives, ordering numbering, and convenience of 5-Likert test questions and script format. Also, the survey form was checked by two Turkish language teachers in terms of clarity, conformity to grammar rules. Necessary changes were made in terms of the suggestions of the experts on the survey form. As a pilot study, researchers administered the survey form to randomly selected 15 university students to determine whether there are unclear items, sentences that need clarification, and sufficiency of the application period. After receiving the suggestions of the field experts and data obtained from the pilot study, the survey was finalized and sent to email and What's App groups of randomly selected university students who took an online education from various universities in North Cyprus during the pandemic. Responses of 500 university students (205 female, 295 male) studying at different departments were received back via the same method.

Survey 2
Survey2 comprises two parts. The first part of the survey comprises questions to determine the demographic features of the instructors. In the second part of the survey, there are semi-structured questions that the researchers ask to find out whether the teachers received training about online education, taught courses online before Pandemic; online platforms, and the type of online education that the instructors used during Pandemic. In the third part of the survey, there are semi-structured questions to take the evaluations of the instructors about their online teaching (an adaptation of curriculum and course content, online teaching platforms and strategies used, course evaluation, and obstacles they faced) during the pandemic and their further suggestions to improve and ensure the effectiveness of the online education. Two experts in the field and Two Turkish teachers checked the survey as in the quantitative part to ensure content validity. As a pilot study, researchers administered this survey to two instructors. After finalizing the survey in line with the suggestions of experts and pilot study, researchers sent this survey form to randomly selected instructors via e-mail, and the responses of 24 volunteer instructors were received by the same method.

Data Analysis
The quantitative data were analyzed by using SPSS 21 and AMOS 21. For the qualitative analysis; researchers used the coding reliability formula of Miles and Huberman (1994, p. 64): "P (% of Compromise) = [Na(Consensus)/Na(Consensus)+ Nd (Disagreement)] X 100" and reached .87 value. Coding and writing the themes lasted until the researchers agreed to eliminate the bias of the researchers and to ensure the internal validity of the themes. These themes and related coding are presented as a whole in the text. Descriptive analysis and content analysis techniques were used to analyze the qualitative research data. Answers of the students and

instructors to the questions were coded without assigning any names, as confidentiality dictates. Accordingly, students were coded as 'S', and each student was coded as 'S1, S2....'. Researchers coded the instructors as 'I', and each instructor was coded as 'I1, I2, I3, I4...'. The answer of each student and instructor was given in quotation marks followed by the code of the participant in parenthesis. An example of the coding system is given below:

Example-1: '.....' (S(1))
S: Student and 1, 2, 3....: number of the participant.
Example-2: '.....' (I(1))
I: Instructor and 1, 2, 3....: number of the participant.

Results

RQ1: What are the perceptions of students about the benefits of online education?

Students agreed with 30 of 43 benefits of online education stated in the literature (Table1). They disagreed with the 3 benefits of online education (Table 2) and they were indecisive about the 10 benefits of online education (Table 3).

Table 1 Benefits of online education that students agree with

Item number	Benefits	%
2	Enables large numbers of students to access information	93.2
6	Prevents loss of time to access information	84.8
21	Helps to get education from different universities	80.2
15	Increases student participation	76
8	Information is accessible when needed	73.2
16	Working is not a problem during learning	72.6
9	Information can be accessed without place limitation	63.6
11	Provides personalized learning	63.6
22	Allows students to get an education from different educators	63.4
38	Provides constructivist learning	61.2
20	Facilitates students with physical disabilities to access information	61.2
7	Information can be accessed without time limit	61
24	Reaching the subjects over and over helps to consolidate the subjects	60.2
19	A suitable learning environment for students with difficulties	59.4
17	The student can participate in a program that matches the speed of his/her learning	58
27	Enables students to socialize	57.8
18	It is a suitable learning environment for students with social phobia	57
25	Visuals help information storage in memory	56.6
28	Enables collaborative work	55.8
39	Allows individual learning	55
10	Provides access to information at a very low cost	52.6
26	Offers a rich educational environment to the student	49.8
3	Facilitates information sharing	48
37	Improves high-level thinking skills	47.6
35	Facilitates group work in the educational environment	46.2
23	An educator can transfer information to more students	44.6
12	The students can learn with the best learning method suitable for them	40.8
36	Provides effective learning	40.8
13	It is the most effective way of learning	40.4
1	Provides continuous learning compared to traditional teaching	36.4

Table 2 Benefits of online education that students disagree with

Item number	Benefits	%
42	Helps students become participant individuals in their future lives	50
34	Students in the educational environment develop positive attitudes towards each other	43.8
14	Improves learning performance	38.4

Table 3 Benefits of online education that students are indecisive about

Item number	Benefits	%
30	Allows creating original products	55.6
41	Helps students become active individuals in their learning lives	53.6
31	Enables use of new generation methods	51.2
40	Contributes to students being technology literate	49.2
29	Increases creativity	49
43	Increases students' desire for lessons	48.2
33	Creates a more participatory classroom environment	44.8
32	Creates a more active classroom environment	44.2
5	Online education is more qualified than traditional education	41.6
4	Allows equity in education	35.6

RQ2: What are the obstacles faced by the students?
Students emphasized 4 common obstacles that they faced during their online lectures (Table 4). The most common obstacle faced by the students was internet interruptions with a percentage of 60.4%.

Table 4 Obstacles faced by the students during online education

Obstacles	%
Internet interruptions	60.4
Difficulty to access online platforms with mobile phones	23
Not having a suitable room to study at home	56
Not having good knowledge about using online platforms	59.6

RQ3: Which online platforms did the instructors use during Pandemic?
Instructors stated that they used 8 different online platforms to teach their courses. Most of them usedMicrosoft teams and Zoom and also some instructors used more than one online platform (table 5).

Table 5 Online platforms used by the instructors

Online platforms	%
Microsoft teams	62.5
Zoom	37.5
Adobe Connect	25
Google hangout	25
Moodle	25
Google Classroom	12.5
Blackboard	12.5
Google meet	12.5

RQ4.Which type of online education did the instructors offer?
Instructors mostly used the Synchronous two-way interactive method (75%) and secondly, they used the Asynchronous two-way interactive (50%) to teach the course content (Table 6).

Table 6 Type of online education offered by the instructors

Type of Online education	%
Syncronous-One Way passive	12.5
Syncronous-Two Way interactive	75
ASyncronous-One Way passive	12.5
ASyncronous-Two Way interactive	50

RQ5:Which type of adaptations did the instructors make in course content and duration of the course?
Instructors stated that they did not make any adaption of the curriculum to online education. Instructors only removed the live practical parts (lab, internship...) from the course content. Instructors used animations to teach lab topics. Only the instructors from sports sciences reduced the course duration from 40 minutes to 30 minutes.

RQ6:Which strategies did the instructors use to motivate the students and increase student engagement?
Instructors emphasized that they used different strategies to motivate their students towards the course and increase their engagement in the course (Table 7). One instructor said that " *I used two-way feedback to gather information about the students' understandings and to assist them to advance their own learning and questioning. Also, most frequently I used questioning strategy to check students' understanding and to engage and challenge them. Especially, I tried to ask simple questions to the students. Students became very happy as they could easily answer the questions*" (I(8)).

Table 7 Strategies to motivate students and increase their engagement

Strategies	%
Two-way feedback	100
Video presentations	67
Question-answer	100
Problem-solving	33.3
Discussion	100
Collaborative learning	33.3
Make students listen to relaxing music	16.6
Warm greetings	100
Asking students about their problems (health,food, psychological..)	83.3
Asking questions to relate the topic to daily life	33.3
Asking simple questions so that students can answer easily and feel happy	33.3
Letting students ask questions	100
Giving students the chance to make powerpoint presentations about topics	50
Using more visuals to attract their attention	66.6

RQ7:How did the instructors evaluate the online learning of their students?
Instructors stated that they evaluated the online learning of their students by using 6 different tools (Table 8).

One instructor said that ' *I evaluated my students with online quizes, midterm, and final exams. In addition, I evaluated homeworks, projects and also presentations of my students to attract their attention to the lesson'* (I (19)).

Table 8 Evaluation of online learning of students

Evaluation tools	%
Online quiz	75
Take home homeworks	100
Projects	12.5
Student presentations	37.5
Essay writing	37.5
Midterm and final exams	100

RQ8:Which online resources did the instructors use?
Instructors stated that they used their own powerpoint presentations, videos, online books, and research articles also animations as resources to support their online teaching (Table 9). 100% of the participant instructors used their power point lecture notes, and also most of them displayed videos related to each topic. One instructor stated that "*All of my materials were ready as I have taught online courses before. I prepared all of my lecture notes as powerpoint presentations. I had my students watch the videos I found on YouTube on topics*" (I (2)).

Another instructor pointed out that "*I made powerpoint presentations in my lessons. I gave research assignments to my students. I sent them the links of online books and research articles especially free ones but unfortunately, we couldn't do laboratory experiments. I found laboratory animations prepared by many institutions such as Fisher on the internet and showed them to my students. There are few lab animations on the Internet, and unfortunately, you have to pay a high fee to access them*"(I(9)).

Table 9 Online resources used by the instructors

Online resources	%
Their powerpoint lecture notes	100
Videos on You Tube related to topics	50
Online books	75
Online research articles	37.5
Animations about lab topics	25

RQ9:What are the obstacles faced by the instructors?
Instructors mentioned about 7 different obstacles that they faced during online teaching (Table 10). 100% of the instructors mentioned internet interruptions, technological infacilities of the students, and problems of students accessing online platforms via their cell phones.

Table 10: Obstacles faced by the instructors.

Obstacles	%
Internet interruptions	100
Technological infacilities of students (not having a laptop, computer..)	100
Accessing problems of students via cell phones to online platforms	100
Apathy of students to online lessons	25
Insufficient knowledge of students about online education	100
Low student participation	25
Low student engagement	25

One instructor claimed that "*Many of my students lost their internet during my online classes. Since students did not have sufficient knowledge about online education before, they had problems while downloading their lecture notes from the system and uploading their homework to the system. Especially students who connected to online classes with their mobile phones had a lot of problems*" (I(14)).

Another instructor stated that "*When universities closed their campuses due to COVID 19, students returned to their homes. Some students left their computers, notebooks, and other personal belongings in their dormitory rooms because they thought they would return. Therefore, these students attended online classes with their mobile phones. I took attendance at the beginning of each lesson. Despite the high participation rate of students in my lessons, most of the students preferred to listen passively in class and did not actively take part in the classes*"(I21)).

RQ10: What are the suggestions of the instructors to increase the efficiency and quality of online education?
Instructors made suggestions for government, universities and all instructors to increase the efficiency and quality of online education (Table 11).

Table 11 Suggestions of the instructors

THEME 1:Suggestions for the government
Subthemes
Providing free internet to all students
Improvement in internet infrastructure
Computer and laptop custom reduction
Free COVID-19 tests for all teachers and students
THEME 2: Suggestions for universities
Subthemes
Adding technology course to the curriculum of all departments
Continuous in-service training to all teachers about online education
Offering hybrid education in future
Offering seminars to nurture psychological well-being to all students and staff
Salary increase due to over workload
Increase in group numbers and a decrease in student number in each group for each course
THEME 3: Suggestions for teachers

Subthemes
Working in collaboration
Regular online meetings to share experiences
Make more efforts to improve knowledge about effective online teaching
Paying more attention to students' problems
Using different online platforms
Using both Synchronous and Asynchronous online education

Discussion and Conclusion

The sudden outbreak of COVID-19 started in late 2019 in China, spread to all other countries at the global level. COVID-19 crisis has interrupted life with lots of loss of life, health impacts, and loss of livelihoods and affected education highly by impacting 87.6% of the world's total enrolled students. All the universities closed their campuses and shifted to online education. Although students accessed online education in digitally developed countries, unfortunately, students in most developing and under-developed countries couldn't. Afew recent research analyzed the challenges and also the opportunities of e-learning during Pandemic COVID-19. Evaluation of the quality of the online education delivered by the universities in each country is crucial to meet the needs and expectations of their students.

In this light, this study aimed to give new insights to the education management of the universities based on the online education experiences of students and instructors during Pandemic COVID-19. Researchers planned a mixed research design. 500 randomly selected students (41% female, 59% male; from different departments, most of them between the age of 21-30) and 24 instructors (62.5% female, 37.5% male; most between the age of 41-45, % 62.5 from state universities) from various departments of different universities participated in this research.

Students agreed 30 of 43 benefits of online education stated in the literature such as enables large numbers of students to access information, prevents loss of time to access information, helps to get education from different universities, increases student participation, information is accessible when needed, working is not a problem during learning, information can be accessed without place limitation, provides personalized learning, allows students to get education from different educators, provides constructivist learning, facilitates students with physical disabilities to access information, information can be accessed without time limit, accessing the subjects over and over helps to consolidate the subjects, a suitable learning environment for students with difficulties, student can participate in a program that matches his/her learning speed, enables students to socialize, it is a suitable learning environment for students with social phobia, visuals help information storage in memory, enables collaborative work, allows individual learning, and provides access to information at a very low cost. Many researchers advocated many potential benefits of online learning that the participant students agreed with in this study such as accessing at the most convenient time (Ruttenbur *et al*., 2000; Josep, 2020), cost-effective (Urdan and Weggen, 2000; Josep,2020), up-to-date (Asymetrix, 1997), quick (Cross, 2000; Hall, 2000), retainable (Asymetrix, 1997; Urdan and Weggen, 2000); risk-free (Urdan and Weggen, 2000), consisted (Snook,2000), interactive and collaborative (Urdan and Weggen, 2000), easy to track (Block and Dobell, 1999; Josep, 2020), empower IT skills (NEC, 2000),offers a wide selection of courses (Josep,2020).

Students disagreed with the items such as 'online education helps students become participant individuals in their future lives, students in the educational environment develop positive attitudes towards each other, and improve learning performance. This conclusion may be due to not experiencing online education before so they couldn't imagine that online education could help them to become participant individuals such as in many seminars, webinars, and conferences. They may believe that their learning performance is better in face-to-face learning and they couldn't find time to communicate with each other and develop positive attitudes.

Students emphasized 4 common obstacles that they faced during their online lectures. These obstacles in rank are internet interruptions, not having good knowledge about using online platforms, not having a suitable room to study at home, and difficulty accessing online platforms with mobile phones. Childs (2000) points out that technological limitations may cause frustrations and demotivation among learners during e-learning.

Most of the instructors used Microsoft teams and Zoom online platforms and used Synchronous-Two Way interactive and Asynchronous Two-way interactive method to teach. Instructors stated that they didn't adapt the curriculum to online teaching and only removed lab practicals from the course content and only the instructors from sports sciences reduced the duration of each course from 40 to 30 minutes. Bao (2020) suggests that faculty members need to divide the teaching content into several small modules and this supports our findings that instructors can adjust the duration of each small module as lasting approximately 20-25 minutes in order to ensure that students concentrate on online study.

Instructors emphasized that they used different teaching strategies to motivate their students towards the course and increase their engagement. These strategies are two-way feedback, video presentations, question-answer, problem-solving, discussion, and collaborative learning, make students listen to relaxing music, warm greetings, asking students about their problems, asking questions that relate the topic to daily life, asking simple questions so that students can answer easily and can feel happy, letting students ask questions, giving students chance to make powerpoint presentations, and using more visuals to attract their attention to the topics. As evaluation tools, instructors used online quizzes, take-home homeworks, projects, student presentations, and essay writings. Instructors stated that they used their own powerpoint presentations, videos, online books and research articles also animations as resources to support their online teaching. Bao(2020) supports the strategies used by the participant instructors and also suggests additional strategies for the instructors such as slowing down the speech to allow their students to capture key knowledge points of the course and modifying the homework and reading assignments to strengthen the active learning of the students outside of class. As the instructors experience online education more, they will explore many more resources to provide psychosocial support, digital learning management systems, systems built for use on basic mobile phones, massive Open Online Course (MOOC) Platforms, self-directed learning content, mobile reading applications, collaboration platforms that support live-video communication and tools for teachers to create digital learning content which are highly suggested by UNESCO (2020).

Instructors pointed out the obstacles that they faced during their online lectures as follows: internet interruptions, problems of students to download lecture notes, access online platforms and exams via cell phones, technological infacilities of students, apathy of students about online education, low student participation and engagement in courses. Similar obstacles and strategies to solve them were stressed by many authors in the literature (Collision et al.,2000; Hus et al.,2015; Quevillon,2020; Trammell and LaForge, 2017).

Suggestions of the instructors to increase the efficiency and quality of education can be classified into three categories: for government, for universities, and for instructors. Instructors suggested that the government can provide free internet to all students, improve internet infrastructure, reduce the custom of computers and laptops and test all teachers and students free for COVID-19 before face-to-face education starts. In addition, instructors pointed out that universities can add technology courses to curricula of all departments, give continuous training to teachers about online teaching, offer hybrid education, offer seminars to nurture the well-being of all students and staff, and increase group numbers with few students in each course, and finally increment in their salaries due to over workload. Last, instructors suggested that all instructors need to work collaboratively, have regular meetings to share their experiences, make more efforts to improve their knowledge about online teaching, pay more attention to problems of students, use different online platforms, and type of online teaching at the same time. Zhang et al. (2020) made similar types of suggestions for the government of China such as the use of high-quality broadband, speed up technology iteration, to equip teachers and students with electronic devices to meet the needs of online teaching and learning, providing systematic teacher training for use of online platforms for high-quality teaching, providing legal, financial and administrative support from government to the instructors for their professional development. We need more creativity as more countries close their schools to mitigate the problems in online education such as agreeing telecom companies to eliminate the cost of accessing online materials from the site of the Ministry of education and adaptation of existing online platforms for the use in smartphones (World Bank,2020).

This type of in-depth research can be carried out by all universities globally and the data will help all education leaders and management of the universities to determine the weak and strong points of their online education and re-manage and redesign their online education to meet the needs of students. Universities can produce solutions to mitigate their problems in online education and increase the quality of online education which can be accessed by all students. Also, based on the data instructors can adapt the curricula to online education, re-plan the duration of the lectures, the quantity of instruction, course content, and adapt teaching strategies, presentation techniques, teaching speed, style of assessment to online education, decide the best type of the online platform for their students and also plan their future education.

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Author Contributions
H.Ş is the corresponding author. H.Ş designed the study, prepared the survey forms, conducted statistical

analyses, interpreted the data, and wrote down the article. F.Y.L. and M.Ç. contributed to research by collecting data from volunteer students and instructors, contributed to the interpretation of data. All authors read and approved the final manuscript.

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