

Evaluation of Teaching Methods and Technical Opportunities for the Distance Education Process of Veterinary Faculty Students in Türkiye During the COVID-19 Pandemic

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ABSTRACT

Covid-19 has caused the death of approximately 7 million people and caused severe problems in all areas of life, especially in education. Upon the detection of the first case in Turkey, education was suspended in all educational institutions on March 16, 2020, and it was decided to continue education in a digital environment through distance and open education for the 2019-2020 spring semester. This study aimed to evaluate the opinions and thoughts of veterinary faculty students about the methods and technical possibilities of distance education courses. A questionnaire was administered to 1599 students via "Google Docs" between December 10, 2020, and January 11, 2021, to those who were willing to participate in the survey among 2nd, 3rd, 4th, and 5th-year students who were studying in veterinary faculties in Turkey and had face-to-face and distance education experience. The statistical package program was used for the SPSS 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.). Descriptive frequencies and percentages were given for categorical variables. In the study, it was determined that 67.2% of the participants used their computers. However, lack of professional development (75.4%), technical problems (73.3%), access to the internet (56.8%), etc. were identified as the difficulties of online courses. Although students found the course duration sufficient, they thought the courses should be supported with PDF, Word, and PowerPoint documents (78.2%). In addition to the security concerns of distance education, students also stated that they did not prefer distance education because veterinary medicine education is a practical field and because of technical problems. Students' concerns, such as professional development and professional-social interaction due to being away from school, can be addressed with support training after the pandemic.

Keywords: Covid-19, distance education, online education, pandemic, veterinary students

Türkiye’de Veteriner Fakültesi Öğrencilerinin COVID -19 Pandemisinde Uzaktan Eğitim Sürecine Yönelik Derslerin İşlenme Yöntemi ve Teknik Olanakların Değerlendirilmesi

ÖZ

Covid-19 yaklaşık yedi milyon insanın ölümüne sebep olmuş, başta eğitim olmak üzere hayatın her alanında ciddi sorunlara neden olmuştur. Türkiye’de ilk vakanın tespit edilmesi üzerine 16 Mart 2020 tarihinde tüm eğitim kurumlarında eğitime ara verilmiş, 2019-2020 bahar dönemi için uzaktan ve açık öğretim yoluyla dijital ortamda eğitime devam edilmesine karar verilmiştir. Çalışmada, veteriner fakültesi öğrencilerinin uzaktan eğitim ile verilen derslerin yöntemleri ve teknik olanakları hakkındaki görüş ve düşüncelerini değerlendirmesi amaçlandı. Türkiye’de veteriner fakültelerinde öğrenim görmekte olan, yüzyüze ve uzaktan eğitim deneyimi yaşamış 2, 3, 4 ve 5. sınıf öğrencilerinden ankete katılmak isteyenlere 10 Aralık 2020- 11 Ocak 2021 tarihleri arasında “Google docs” aracılığıyla 1.599 öğrenciye anket uygulaması yapıldı. Verilerin değerlendirilmesinde SPSS 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) istatistik paket programı kullanıldı. Çalışmada kategorik değişkenler için tanımlayıcı olan frekans ve yüzdelik dilimleri verildi. Çalışmada kendi bilgisayarını kullananların oranının %67.2 olduğu tespit edildi. Bununla birlikte, çevrimiçi derslerin zorlukları olarak mesleki gelişim eksikliği (%75.4); teknik sorunlar (%73.3); internete erişim (%56.8) vb. belirlendi. Öğrenciler ders süresini yeterli bulmakla birlikte, derslerin PDF, Word ve PowerPoint dokümanlarıyla desteklenmesi gerektiğini düşünmektedir (%78.2). Uzaktan eğitimin güvenlik kaygılarının yanı sıra öğrenciler, veteriner hekimliği eğitiminin uygulamaya yönelik bir alan olması ve teknik sorunlar nedeniyle tercih etmediklerini de belirtmektedir. Öğrencilerin okuldan uzak kalmaya bağlı mesleki gelişim ve mesleki-sosyal etkileşim gibi kaygılarının pandemi sonrası yapılacak destek eğitimleri ile giderilebileceği önerilebilir.

Anahtar Kelimeler: Covid-19, online eğitim, pandemi, uzaktan eğitim, veteriner fakültesi öğrencileri

INTRODUCTION

A Pandemic is an epidemic occurring worldwide or over a vast area, crossing international boundaries and usually affecting many people (Last 2001). Epidemics such as influenza, HIV, plague, malaria, cholera, and SARS have occurred in the past (Shoals 2019). COVID-19, which emerged in 2019, has also been defined as a pandemic by the World Health Organization (WHO) as of March 11, 2020. The first COVID-19 case in Türkiye was reported on March 11, 2020. Since it started, the total number of reported cases worldwide has reached 185 million, and nearly 7 million people have died because of this disease (WHO 2021). The mode of transmission of COVID-19, like general influenza, is by the respiratory route. Since the risk of catching it increases in indoor places, it has become necessary to suspend education in educational institutions to prevent its spread. Social distancing (individual and social isolation) has been put into practice in Türkiye to prevent the transmission of COVID-19. In order to avoid interruptions in the field of education, the “distance education” method has been employed by using the available opportunities of digital world (MH 2019). Distance education is a form of education made from a particular center using various communication tools without the face-to-face presence of the student and teacher (TLS 2020).

During the pandemic, in Türkiye, The Council of Higher Education (CHE) first decided on March 13 to suspend education at universities for three weeks as of March 16, 2020 (CHE 2020a), and then on March 23 due to the uncertainty of the process, decided to continue education in the digital environment through distance and open education for the 2019-2020 spring academic semester (CHE 2020b). During this time, it was found that the majority of Turkish universities have the technology infrastructure to allow distant learning, and CHE would quickly assist those who do not. (Dikmen and Bahçeci 2020).

Following period, the publication of the “New Normalization Process Guide in the Global Epidemic” by CHE was announced on July 30, 2020. It is stated that “the guide provides a general framework according to possible scenarios and gives relevant university committees authority to apply for different programs according to the regional and local course of the epidemic.” The guide includes framework decisions and suggestions under “Distance Education Practices, Applied Trainings, Assessment and Evaluation Practices, Foreign Students, Meetings, Congresses and Exchange Programs.” This guide has allowed different practices to be implemented in universities according to the regional and local course of the epidemic during the epidemic's progression. The “New Normalization Process in the Global Epidemic 2020” guide published by CHE states that distance education

performed due to the COVID-19 global epidemic is the emergency distance education” application of the new normal, and it also emphasizes that they were different from the distance education implemented by preplanning (CHE 2020c).

The online learning method used in distance education is described as a tool that can make the teaching-learning process more student-centered, innovative, and flexible. Online learning refers to educational experiences that take place in either synchronous or asynchronous settings on various internet-connected devices, such as laptops and mobile phones. These settings allow for anywhere (independent) learning and interaction between students, teachers, and other students (Singh and Thurman 2019). Serçemeli and Kurnaz (2020) stated that students did not face any problems in terms of self-efficacy regarding the use of the distance education system; they approached it positively because of re-watchable video recordings, flexible education opportunities, and time-saving.

This study was prepared to evaluate the opinions and thoughts of students about the methods and technical possibilities of distance education courses that started with the COVID-19 pandemic in veterinary medicine education.

MATERIAL and METHODS

In the study, a survey was created based on the studies on “distance education during the pandemic period” (Serçemeli and Kurnaz 2020; Kürtüncü and Kurt 2020). According to 2019 data, there are 10.946 students studying in veterinary faculties in Turkey and the questionnaire applied to the other grades (2nd, 3rd, 4th and 5th) except for the first year students. The questionnaire evaluated seven demographic questions and eight questions about the method of teaching the courses. The survey form will be applied to the students who want to participate in the study, and the name and surname of the participating students will not be requested in the survey forms. It was sufficient to apply the questionnaire form to approximately 700 people with a 95% confidence interval, and a total of 1599 students, 518 from 2nd grade, 379 from 3rd grade, 342 from 4th grade and 360 from 5th grade, participated in the study (Table 1). The questionnaire was administered to students who volunteered to participate in the study. The survey application was delivered to students via “Google” (docs.google) between December 10, 2020 and January 11, 2021, and data were obtained. “SPSS 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.)” statistical package software was used to evaluate the data. In the study, the frequencies and percentages of the data obtained from participants’

tool choice to follow online courses, their preferences about the method of the theoretical and practical courses, the problems they encountered, the course duration preferences, and the tools that the courses

should be supported by are given in the tables. The demographic distribution of the data was presented in tabular form based on the classes of the participants.

RESULTS

The distribution of these students according to region, gender, grade point average, and place of residence is shown in Table 1. 55.6% of the

participants stated that they lived in the city center. Gender distribution was in favor of male students (F: 45.7%/M: 54.3%) and the highest participation was from faculties in the Eastern Anatolia Region (20.2%).

Table 1. Distribution of demographic data based on the class of the participants

Demographic Criteria	Class							
	2nd		3rd		4th		5th	
	Number	%	Number	%	Number	%	Number	%
Region								
Mediterranean	89	5.6	72	4.5	89	5.6	60	3.8
Eastern Anatolia	125	7.8	67	4.2	39	2.4	92	5.8
Aegean	12	0.8	25	1.6	14	0.9	20	1.3
Southeastern Anatolia	69	4.3	47	2.9	79	4.9	29	1.8
Central Anatolia	107	6.7	67	4.2	77	4.8	38	2.4
Black Sea	81	5.1	47	2.9	29	1.8	46	2.9
Marmara	35	2.2	54	3.4	15	0.9	75	4.7
Total	518	32.4	379	23.7	342	21.4	360	22.5
Gender								
Female	272	17.0	188	11.8	130	8.1	141	8.8
Male	246	15.4	191	11.9	212	13.3	219	13.7
Total	518	32.4	379	23.7	342	21.4	360	22.5
Point average								
Less than 2.00	8	0.5	6	0.4	8	0.5	5	0.3
2.00-2.50	53	3.3	52	3.3	68	4.3	94	5.9
2.51-3.00	174	10.9	186	11.6	163	10.2	182	11.4
3.01-3.50	198	12.4	112	7.0	82	5.1	70	4.4
3.51 and above	85	5.3	23	1.4	21	1.3	9	0.6
Total	518	32.4	379	23.7	342	21.4	360	22.5
Place of residence								
Provincial center	277	17.3	193	12.1	195	12.2	224	14.0
District	132	8.3	108	6.8	85	5.3	87	5.4
Town	9	0.6	5	0.3	6	0.4	3	0.2
Neighborhood (Village)	100	6.3	73	4.6	56	3.5	46	2.9
Total	518	32.4	379	23.7	342	21.4	360	22.5

More than one answer was received for the “Which of the following tools do you use during online/distance education?” (Table 2) question and a total of 2214 responses were received. It was

determined that the rate of those using their computer is 67.2%; those using their smartphone is 51.5%; those using someone else’s computer is 14.4%, and those using someone else’s smartphone is 1.8%.

Table 2. Participants' means for following online courses*

Lesson tracking tool	Number	%
My own computer	1075	67.2
My own tablet	48	3.0
My own phone	824	51.5
Someone else's computer	230	14.4
Someone else's tablet	8	0.5
Someone else's phone	29	1.8
Other	3	0.2

* More than one option is marked

While 52.9% of students preferred online or distance learning for theoretical courses, 21.3% of students preferred online or distance learning for practical courses. While 17.8% of the students thought that

theoretical courses should be given face-to-face, 60.7% of the students said that practical courses should be given face-to-face (Table 3).

Table 3. Preferences of the participants regarding the way of teaching theoretical and practical courses

Type of course	Theoric		Practical	
	Number	%	Number	%
Online/remote	846	52.9	340	21.3
Face to face	284	17.8	970	60.7
Hybrid	496	29.3	259	16.2
Other	-	-	30	1.9

For the question "What are the difficulties of following courses online/remotely in the veterinary department?", it was determined that the lack of professional development (75.4%) was the most frequently mentioned problem, followed by technical

problems (73.3%), difficulties in accessing the internet (56.8%), being away from school (53.0%) and social environments (43.6%) (Table 4).

Table 4. Problems faced by the participants in online courses*

The difficulty experienced	Number	%
Difficulties accessing the Internet	909	56.8
Facing technical problems (computer, tablet, phone malfunction, system problems, etc.)	1172	73.3
Being away from social situations	697	43.6
Getting away from the school environment	847	53.0
Not being able to ask questions about incomprehensible matters	560	35.0
Lack of professional development	1206	75.4
Excessive intensity (Video, homework, etc.)	9	0.6
Other	22	1.4
I don't have any problems	22	1.4

* More than one option is marked

Regarding "the duration of a lesson hour," 36.0% of the students answered that it should be in the range of 21-30 minutes; 35.3% of them said that it should be between the range of 31-40 minutes; 12.9% of

them answered that it should be between the range of 41-50 minutes (Table 5).

Table 5. Opinions of the participants about the duration of a lesson

Lesson duration	Number	%
5-10 min	37	2.3
11-20 min	136	8.5
21-30 min	576	36.0
31-40 min	564	35.3
41-50 min	206	12.9
51-60 min	80	5.0

To the question of, “Which of the following methods would you like digital education course to be supported with?”, 78.2% of the participants answered

PDF Word and PowerPoint documents, 77.2% with the lecturers' notes/papers, 66.1% with online video recordings (Table 6).

Table 6. Opinions of the participants about which tools should be used in distance education courses*

Method to be supported	Number	%
Online / Live broadcast	783	49.0
Textbook	761	47.6
PDF, Word, Power point document	1250	78.2
Offline video recordings	1057	66.1
With the lecturers' notes/papers	1235	77.2
Other	19	1.2

* More than one option is marked

DISCUSSION

With the emergence of the COVID-19 pandemic, distance education was started in veterinary departments too. However, with the maintenance of the process, problems related to practical courses, especially for the year 2020, began to be expressed. It can be said that this study, which was carried out to determine how students come up with problems such as teaching methods and technical opportunities of the courses, is essential by including all university departments in Türkiye, by having a high number of participants and by including the opinions of people who had experienced both face-to-face and distance education.

Although it has been asserted that universities worldwide are increasingly running to distance education, it is reported that there are problems in terms of technological competence and security (Ali 2020). Studies on distance education reveal that there are various options regarding the means of class participation. Smartphones, laptops, tablets, and personal computers are the most commonly used electronic devices to attend online classes during the COVID-19 pandemic (Abushammala et al. 2021). A similar study by Karatepe et al. (2020) of teacher candidates states that 68.7% of students participating in the study follow lessons with a computer and 59.5% of them with a mobile phone. In a study in which students from the Department of Physiotherapy and Rehabilitation participated, it is stated that 61.5% of the students follow lessons by computer and 35.5% by mobile phone (Altuntaş Yılmaz 2020). The results of the study conducted by Serçemeli and Kurnaz (2020) showed that 75.5% of students used a smartphone, while 42.4% of students used a computer. Those who used someone else's computer or smartphone made up 12.8% and 3.9% of the sample, respectively. In the study conducted with a total of 1,392 veterinary students and researchers from 92 different countries, it was determined that the most used device was a smartphone (51.0%), followed by a laptop (32.8%) and tablet (9.6%) (Mahdy 2020). Another study determined that 61.5% of students accessed

education using a computer, 35.5% using a phone, and 3% using a tablet¹⁵ (Altuntaş Yılmaz 2020). In the study, in which the participants were allowed to choose more than one device, like in other studies, it was found that veterinary department students primarily used their computers (67.2%) and their smartphones (51.5%) in lessons (Table 2). According to Mahdy (2020), research must be done to give students access to computers, the internet, and tablets. Nearly all students should also own a computer, and these devices must always be available to support successful distance learning, which is expected to be implemented in 40% of informal education (CHE 2020c), regardless of the pandemic period. In addition, determining which devices students use in their online learning will help to ensure the accessibility of the prepared educational content by many students.

World Organization for Animal Health (OIE) has specified the characteristics that ‘Day 1 graduates’ veterinarians should have in order to ensure the quality of national veterinary medicine services of member countries and has developed a “Model Core Veterinary Curriculum” (OIE 2013). This curriculum was prepared for Veterinary Education Establishments of OIE member states where most courses are applied. Similarly, in the evaluation processes of EAEVE (European Association of Establishments for Veterinary Education), for which 13 university departments from Türkiye have applied for membership, it is observed that an applied learning-based approach is prioritized at every stage of veterinary medicine education (EAEVE 2021). It has been stated that in units with applied education, students need more face-to-face education. Performing the applications after the academic lessons is crucial for the student’s professional practice skills (Keskin and Özer Kaya 2020). Mahdy (2020) reports that fulfilling students' veterinary competencies with only the online education system is not easy. In a survey of veterinary students in Egypt, 53% of the students stated that online anatomy learning cannot replace face-to-face teaching

(Mahdy and Sayed 2021). Some pre-clinical courses, such as Anatomy and Histology, require direct macroscopic and microscopic demonstration of different organs and structures of different animals to students (Brassett et al. 2020). Some courses, such as Medicine, Surgery and Theriogenology (Gynecology, Obstetrics and Andrology) require direct handling of clinically ill animals to learn the management of critically ill animal species (Dedeilia et al. 2020). Students will need a practical demonstration of practice (Brassett et al. 2020; Dedeilia et al. 2020). The study determined that veterinary department students also preferred face-to-face (60.7%, n:970) for applied courses in parallel with the abovementioned studies (Table 3). It can be said that this situation aligns with the recommendations of OIE and EAEVE regarding their efficiency and veterinary faculty students' professional development.

The student's binary named "Distance learning strategies: What do we know about the effectiveness?" organized by UNESCO (2021) due to the COVID-19 pandemic stated that technological preparations should come at the beginning of the preparations. Internet-related issues such as availability, connectivity, speed, infrastructure, and cost in developing countries hurt students' online learning (Mahdy and Sayed 2021). In the studies on the subject (Al-Balas et al. 2020; Keskin and Özer Kaya 2020; Kurtüncü and Kurt 2020; Serçemeli and Kurnaz 2020), internet or technical problems were the main ones among the difficulties. In this study, "What are the difficulties of following the courses taught in the veterinary department online/remotely without coming to school?" was asked, and it was determined that the most critical problem among the experienced difficulties was the lack of professional development (75.4%), followed by technical problems (73.3%), difficulties in accessing the Internet (56.8%), being away from school (53.0%), and social environments (43.6%) (Table 4). These results show that veterinary department students, unlike other university students, prioritize professional development and are more willing to obtain face-to-face education due to their anxiety in this regard, as seen in Table 3. The problems encountered, such as Internet access and technical issues, match those of other studies. Although the rate of participants living in city centers where internet access is more possible than in rural areas was 55.6% (Table 1), the rate of internet access difficulty was determined as 56.8%. Students need Internet access to participate in online courses, creating a significant global inequality in veterinary medical education programs (Edwards, 2004). It should be noted that poor connectivity in rural areas can result in lost educational opportunities for students living in these areas (Mohammed et al. 2019). In order to maintain distance education smoothly and successfully, infrastructures should be developed, and students should be supported in terms of internet access in city centers and rural areas.

The 45-minute lesson period that were applied before the pandemic was changed to 30 minutes in primary, middle, high school education (MNE 2020). Higher Education Institutions maintained this period as 40-45 minutes. If online courses take a long time, students feel sleepy and tired and lose their motivation to participate in online learning (Mahdy 2020; Wilcha, 2020). A study conducted in the field of social sciences reported that the highest rate of students (36.2%) preferred the lecture duration to be between 15 and 20 minutes (Serçemeli and Kurnaz 2020). Afşar and Büyükdoğan (2020) determined in their study that 90.4% of 432 students claim 25 minutes lessons or more. It was determined in the study that 36.0% of the students stated that it should be in the range of 21-30 minutes, 35.3% in the range of 31-40 minutes, and 12.9% between 41-50 minutes (Table 5). Even though departments have different preferences regarding course length, it is crucial to keep these durations within reasonable bounds to maintain followability. The ideal course duration should be determined in line with the student's opinions and applied in distance education processes in this manner.

A study conducted with students from the Education Department studying in the Central Anatolia Region stated that 22% of the students prefer oral presentations, and 18.7% prefer scanned lecture notes (Karatepe et al. 2020). In the study of Serçemeli and Kurnaz (2020), 79.4% of the students expressed that lectures should be supported with lecturer's notes, 34.6% with online video recordings, and 33.5% with documents such as PDF, word, and PowerPoint. Frequent access to asynchronous learning materials improves veterinary students' performance (Schoenfeld-Tacher and Dorman 2021). Can (2020) also stated that students prefer written materials and less participation in online courses and that the reason for this is the problems experienced in accessing the Internet. Mahdy (2020) reported that participants were provided online study materials mainly through PDF lecture notes, e-books, YouTube videos, university platforms, educational websites, and applications. In the study, students were asked, "Which of the following methods would you like distance education courses to be supported with?" and 78.2% of the participants answered with documents such as PDF, word, PowerPoint; 77.2% with the lecturers' notes; 66.1% with online video recordings (Table 6). Thus, students prefer sources such as the instructor's notes, PDF, word, and PowerPoint because they are always accessible and not likely to be affected by internet access problems.

CONCLUSION

As a result, given the importance of practical/applied veterinary education, students from veterinary departments significantly prefer face-to-face education. This preference may concern that their

professional development will be improved with face-to-face practical/applied learning. Accordingly, mainly applied learning lessons should be done face-to-face as much as possible while taking all necessary precautions and giving students the right to choose. Studies should be carried out to eliminate the concerns of the students by fulfilling the missing training after the pandemic. Veterinary students' thoughts and opinions can guide this issue by identifying problems in distance education in general.

Ethics Committee Approval: The permission for the study was received on December 04, 2020, from the “Non-Interventional Research Ethics Board of the Department of Health Sciences of Kafkas University.”

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REFERENCES

- Abushammala, M., Qazi, W., & Manchiryal, R. K. (2021).** The impact of COVID-19 on the private higher education system and students in Oman. *Journal of University Teaching & Learning Practice*, 18(3), 1-20. <https://doi.org/10.53761/1.18.3.13>
- Afşar, B., & Büyükdöğün, B. (2020).** Covid-19 pandemisi döneminde İİBF ve SBBF öğrencilerinin uzaktan eğitim hakkındaki değerlendirmeleri. *Karatay Sosyal Araştırmalar Dergisi*, 5, 161-182.
- Al-Balas, M., Al-Balas, H.I., Jaber, H.M., Obeidat, K., Al-Balas, H., Aborajoo, E.A., Al-Taher, R., & Al-Balas, B. (2020).** Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: current situation, challenges, and perspectives. *BMC Med Educ* 20, 341, 1-7. <https://doi.org/10.1186/s12909-020-02257-4>
- Ali, W. (2020).** Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher Education Studies*, 10(3), 16-25, 2020.
- Altuntaş Yılmaz, N. (2020).** Yükseköğretim kurumlarında COVID-19 pandemisi sürecinde uygulanan uzaktan eğitim durumu hakkında öğrencilerin tutumlarının araştırılması: Fizyoterapi ve Rehabilitasyon Bölümü örneği. *Necmettin Erbakan Üniversitesi Sağlık Bilimleri Fakültesi Dergisi*, 3(1), 15-20.
- Brassett, C., Cosker, T., Davies, DC., Dockery, P., Gillingwater, TH., Lee, TC., Milz, S., Parson, SH., Quondamatto, F. & Wilkinson, T. (2020).** COVID-19 and anatomy: Stimulus and initial response. *Journal of Anatomy*, 237, 393-403. <https://doi.org/10.1111/joa.13274>
- Can, E. (2020).** Coronavirüs (Covid-19) pandemisi ve pedagojik yansımaları: Türkiye’de açık ve uzaktan eğitim uygulamaları, *AUAd*, 6(2), 11-53.
- Council of Higher Education (CHE). (2020a).** Koronavirüs (Covid-19) bilgilendirme notu: 1 <<https://covid19.yok.gov.tr/Documents/alinan-kararlar/02-coronavirus-bilgilendirme-notu-1.pdf>>, [Erişim Tarihi: 05.04.2021].

- Council of Higher Education (CHE). (2020b).** Başkan Saraçtan Üniversitelerdeki uzaktan eğitim süreci ve YKS'nin yeni tarihine ilişkin basın açıklaması. <<https://covid19.yok.gov.tr/Documents/alinan-kararlar/04-uzaktan-egitim-ve-yks-ertelenmesine-iliskin.pdf>>. [Erişim Tarihi: 05.04.2021].
- Council of Higher Education (CHE). (2020c).** Küresel salgında yeni normalleşme süreci rehberi <<https://www.yok.gov.tr/Documents/Yayinlar/Yayinlarimiz/2020/kuresel-salginda-yeni-normallesme-sureci-2020.pdf>>. [Erişim Tarihi: 05.04.2021].
- Dedeilia, A., Sotiropoulos, MG., Hanrahan, JG., Janga, D., Dedeilias, P. & Sideris, M. (2020).** Medical and Surgical Education Challenges and Innovations in the COVID-19 Era: A Systematic Review. *In Vivo*. 34(3 Suppl), 1603-1611. doi: 10.21873/invivo.11950.
- Dikmen, S., & Bahçeci, F. (2020).** Covid-19 Pandemisi sürecinde yükseköğretim kurumlarının uzaktan eğitime yönelik stratejileri: Fırat Üniversitesi Örneği, *Turkish Journal of Educational Studies*, 7(2), 78-98. <https://doi.org/10.33907/turkjes.721685>
- Edwards, J. (2004).** Global perspectives of veterinary education: reflections from the 27th World Veterinary Congress. *Journal of Veterinary Medical Education*, 31, 9-12.
- European Association of Establishments for Veterinary Education (EAEVE). (2021).** European system of evaluation of veterinary training. <https://www.eave.org/fileadmin/downloads/SOP/EAVE_Budapest_SOPs_merged.pdf>. [Erişim Tarihi: 03.06.2021].
- Karatepe, F., Küçükgencay, N., & Peker, B. (2020).** Öğretmen adayları senkron uzaktan eğitime nasıl bakıyor? Bir anket çalışması. *Journal of Social and Humanities Sciences Research*, 7(53), 1262-1274.
- Keskin, M., & Özer Kaya, D. (2020).** COVID-19 sürecinde öğrencilerin web tabanlı uzaktan eğitime yönelik geri bildirimlerinin değerlendirilmesi. *İzmir Kâtip Çelebi Üniversitesi Sağlık Bilimleri Fakültesi Dergisi*, 5(2), 59-67.
- Kürtüncü, M., & Kurt, A. (2020).** Covid-19 pandemisi döneminde hemşirelik öğrencilerinin uzaktan eğitim konusunda yaşadıkları sorunlar. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi*, 7(5), 66-77.
- Last, JM. (2001).** *Pandemy, A dictionary of epidemiology*. 4th ed. New York, IN: Oxford University Press.
- Mahdy, MAA. (2020).** The impact of COVID-19 pandemic on the academic performance of veterinary medical students. *Front. Vet. Sci.* 7, 594261. doi: 10.3389/fvets.2020.594261
- Mahdy, MAA. & Sayed, RKA. (2021).** Evaluation of the online learning of veterinary anatomy education during the Covid-19 pandemic lockdown in Egypt: Students' perceptions. *Anat Sci Educ.* 15, 67-82. doi: 10.1002/ase.2149
- Mohamed, RY., Skinner, M. & Trines, S. (2019).** An introduction to modern Egypt: A fast-growing country with mounting socioeconomic problems. *WENR World Education News + Reviews*. <<https://wenr.wes.org/2019/02/education-in-egypt-2>>. [Erişim Tarihi: 04.12.2023].
- Ministry of Health, Republic of Türkiye (MH). (2023).** Covid-19 Nedir? <<https://covid19.saglik.gov.tr/TR-66300/covid-19-nedir-.html>>. [Erişim Tarihi: 18.11.2020].
- Ministry of National Education, Republic of Türkiye (MNE). (2020)** Uzaktan eğitim sürecinin detayları. <<http://www.meb.gov.tr/uzaktan-egitim-surecinin-detaylari/haber/21990/tr>>. [Erişim Tarihi: 18.11.2020].

- Schoenfeld-Tacher, RM. & Dorman, DC. (2021).** Effect of Delivery Format on Student Outcomes and Perceptions of a Veterinary Medicine Course: Synchronous Versus Asynchronous Learning. *Vet. Sci.*, 8(13), 1-14. <https://doi.org/10.3390/vetsci8020013>
- Serçemeli, M., & Kurnaz, E. (2020).** Covid-19 pandemi döneminde öğrencilerin uzaktan eğitim ve uzaktan muhasebe eğitimine yönelik bakış açıları üzerine bir araştırma. *Journal of International Social Sciences Academic Researches*, 4(1), 40-53.
- Shoals, J. (2019).** Epidemics and pandemics (Science of the Human Body). Mason Crest Publishers; Illustrated Edition.
- Singh, V., & Thurman, A. (2019).** How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education*, 33(4), 289-306. <https://doi.org/10.1080/08923647.2019.1663082>
- Turkish Language Society (TLS). (2020).** Pandemi. <<https://sozluk.gov.tr>>. [Erişim Tarihi: 20.11.2020].
- UNESCO (United Nations Educational, Scientific and Cultural Organizations). (2020).** Distance Learning Strategies, What do we know about effectiveness? <https://en.unesco.org/sites/default/files/unesco-covid-19_ed-webinar-5-concept-note-en.pdf >. [Erişim Tarihi: 11.04.2021].
- Wilcha, RJ. (2020).** Effectiveness of virtual medical teaching during the COVID-19 crisis: systematic review. *JMIR Medical Education*, 6(2), e20963. <https://doi.org/10.2196/20963>
- World Health Organization (WHO). (2021).** Coronavirus disease (COVID-19) Pandemic. World Health Organization. <<https://covid19.who.int>>. [Erişim Tarihi: 07.07.2021].
- World Organisation for Animal Health (OIE). (2013).** Veterinary Education Core Curriculum OIE Guidelines, <https://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/docs/pdf/AF-Core-ANG.pdf>. [Erişim Tarihi: 04.01.2021].