



# Teachers' and school administrators' perceptions of emergency distance education

Nesip Demirbilek<sup>1</sup>

Received: 15 September 2022 / Accepted: 11 December 2022 / Published online: 20 December 2022  
© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2022

## Abstract

This research was conducted to determine the perceptions of school administrators and teachers about Covid-19 and distance education. The research is a descriptive study conducted to reflect the specific characteristics of the participants. In this context, the research model is the scanning model. In the population of the study, 31 school administrators and 156 teachers voluntarily participated in a province of Turkey in the 2020–2021 academic year. An easily accessible situation sampling technique was used in determining the participants. Within the scope of the research, a distance education satisfaction questionnaire was developed based on the experiences of the researcher himself, and an information form containing the personal information of the participants was used to collect data. The data within the scope of the research were collected by sending the data collection tool prepared online to school administrators and teachers. The data collection tool was delivered to participants via WhatsApp groups via google forms. While analyzing the data obtained within the scope of the study, descriptive statistical analyzes were made in all questions and basic statistical values such as frequency, percentage, standard deviation, mode, median was reported. At the end of the study, it was determined that half of the participants did not consider the distance education conducted in their schools during the epidemic period to be sufficient. Administrators and teachers; 49.7% of them stated that they could partially benefit from distance education while conducting the lessons, 40.1% stated that it is not appropriate to conduct the lessons with distance education, and 10.2% stated that all the lessons could be conducted by distance education.

**Keywords** Distance Education · Academic motivation · Technology · Application · Internet

---

✉ Nesip Demirbilek  
ndemirbilek@bingol.edu.tr

<sup>1</sup> Bingöl University, Genç Vocational School, 12500 Bingöl, Turkey

## 1 Introduction

Today, information and communication technologies can offer a wide range of teaching alternatives from supporting traditional teacher-centered classroom teaching activities to applications that can be customized according to each student's own learning pace and preferences regardless of time and space (Açıkgül et al., 2021; Becker, 2000; Boucher, 1998; Elyazgi et al., 2014; Isisag, 2012; Maryam et al., 2013; Pinar & Akgül, 2020; Postholm, 2007; Selwyn, 2007; Wenglinsky, 2005). The information age (Papadakis, 2021), which has risen in parallel with technological developments and influenced the world (Papadakis, 2021), has also significantly affected life skills, and this has brought to the fore a wide range of competencies based on information and communication technologies-supported decision and solution processes, which we call 21st century skills (Bardakçı & Keser, 2017; Cuban, 2006). All these transformations highlight distance education as an alternative that can be realized to complement and strengthen formal education processes (Eroğlu & Kalaycı, 2020; Katsaris & Vidakis, 2021). As a result of the COVID-19 pandemic that has spread all over the world, the field of education has been affected as in all fields, and in this process, distance education has become an effective option that supports traditional education or can be used instead of traditional education from time to time. The COVID-19 pandemic has affected the education process of 1.6 billion students from 200 countries, necessitating significant changes in education processes worldwide (Mohammed, 2022; UNESCO, 2020). Therefore, the whole world has urgently turned to distance education at all levels of education to minimize the negative effects of the pandemic on human health (Karadağ et al., 2021).

Distance education practices started in Turkey in 1982 with Anadolu University as open education (Bozkurt, 2017; Pinar & Akgül, 2020; Yamamoto & Altun, 2020). Distance education applications, which were previously given in radio and television environment (Bozkurt, 2017; Erturgut, 2010), were later moved to the computer environment with the advanced digital environments provided by internet technologies, and today it has gained a different dimension with the development of mobile devices. In 2012, the Ministry of National Education (MEB) designed the Education and Information Network (EBA) and started distance education activities within its structure. EBA, which has been enriched in terms of content since 2012, has gained a different dimension with the addition of the live lesson application in 2020 (YEĞİTEK, 2020). Today, both the Ministry of National Education and universities have paved the way for distance education activities independent of time and space. This has opened a new era in ensuring the continuity of education and training activities. Today, most educational institutions use distance education to conduct common compulsory or elective courses (Eroğlu & Kalaycı, 2020).

However, there are differences between the nature of distance education activities and emergency distance education activities (Bozkurt & Sharma, 2020; Hodges et al., 2020). Indeed, Hodges et al., (2020) stated that distance education conducted during a crisis is different from a typical distance education process. Accordingly, in the literature, the distance education process carried out in times of crisis without extensive preparation, such as during the COVID-19 pandemic, is referred to as “emergency distance education” (Bozkurt & Sharma, 2020; Hodges et al., 2020). The

critical difference between the two practices is that distance education activities are well-planned learning activities (Hodges et al., 2020) and are characterized by distance between learners and learning resources in terms of time or space (Bozkurt & Sharma, 2020). On the other hand, emergency distance learning can be perceived as educational activities aimed at solving a sudden problem (Golden, 2020). Therefore, it is important to evaluate the distance education processes implemented during the pandemic and this study looks from the perspective of emergency distance education (Aguayo et al., 2022).

Keegan (2003) states that distance education has six critical dimensions. These dimensions are the separation of teacher and student, the role of educational organization, the place of technological tools, two-way communication, the separation of teacher and learning group, and industrialization. Distance education offers numerous opportunities not only for students but also for educators for quality education. From this perspective, distance education enables the use of many different teaching materials such as virtual world applications, online conferencing environments, virtual reality applications, social media applications, offline communication applications, animations, simulations, teaching documents, virtual reality applications (Baker et al., 2009; Beldarrain, 2006; Dalgarno et al., 2009; Jin, 2011; Shih, 2002; Slykhuus et al., 2005; Veletsianos, 2010; Ventura & Martin-Monje, 2016). Therefore, distance education can be considered as a system that provides various learning environments for students who do not have access to face-to-face education (Liu & Ginther, 1999; Rovai & Barnum, 2003).

To summarize the purposes of distance education, it is to spread the latest technologies used for distance education to the public, and thus to maximize information sharing and access, and to ensure standardization in education individually and collectively. In addition, the aim of distance education is to shorten the time between training and practices, to improve individual skills and success, and to provide knowledge through continuous and intensive education (Ağır, 2007). There are four main elements in the basis of the concept of distance education. These elements can be listed as follows (Özarslan, 2008):

- Distance education provides a formal education opportunity through government institutions and students can receive a diploma or certificate when they are successful.
- Through distance education applications, students and teachers can come together in various places and times.
- Distance education can be conducted both simultaneously (synchronously) and at various times (asynchronous). In addition, distance education also offers the opportunity to interact through new communication technologies.
- Distance education provides a link between resources. Thus, design, budget, transmission planning can be created easily.

Distance education has many advantages over traditional education in terms of economic, social, cultural, and psychological aspects. These advantages are stated as follows (Demirbilek, 2021; Aguayo et al., 2022):

Employees can access the internet from wherever they are and receive training remotely.

- Students' situations can be evaluated more objectively and accurately.
- Educational activities can be conducted by considering not only a national but also an international dimension.
- Education can be provided to a large audience in a healthy way without the need for a place.
- Since distance education enriches the lessons in an audio-visual way, students are motivated more quickly.
- Distance education increases the competition among trainers, so that more qualified trainers can be trained.
- Distance education reduces the economic expenditures of institutions and organizations and reduces costs.

However, with the COVID-19 pandemic, the sudden transformation of face-to-face courses into distance education without any planning process has brought many disadvantages in terms of student satisfaction (Altıparmak et al., 2011; Bakker & Wagner, 2020; Demirbilek, 2021).

Especially due to technical problems on the internet, there may be connection problems between students and instructors (Altıparmak et al., 2011; Demirbilek, 2021). In a study conducted by the OECD on students accessing the Internet, approximately 80% of students in Turkey have this opportunity (OECD, 2020a). This drops to 50% for socioeconomically disadvantaged students. When we look at the advantaged group, it is around 90%. When the situation of our country is analyzed in this context compared to the countries of the world, it is clear that the situation of students in our country is more disadvantaged compared to other countries, considering that it ranks 71st among 78 countries and the OECD average is around 95% (OECD, 2020a). Students who do not have financial means may not benefit from Internet-based distance education for economic reasons because they cannot afford computers (Altıparmak et al., 2011; Demirbilek, 2021). Another technological infrastructure necessary for students to participate in emergency distance education activities is to have a computer. When students' access to computers for schoolwork is analyzed, it is around 90% on average in OECD countries, while this rate is around 65–70% in Turkey (OECD, 2020a). This situation may lead to inequalities among students in distance education activities carried out on an urgent basis and will mean interruption of educational activities for some students (Bakker & Wagner, 2020).

When the literature is examined, it is seen that another critical issue in distance education activities is that students have a suitable environment where they can study at home. OECD data shows that approximately 92% of students worldwide have such an environment (OECD, 2020a). In this context, when we look at the situation in Turkey, it is seen that approximately 86% of students can receive education at home. When this situation is considered for students at lower socio-economic levels, it is seen that approximately 80% of students have such an environment, but 20% do not have such an environment (OECD, 2020a). It is seen that this situation, which is

a prerequisite for urgent distance education activities to be carried out, may create disadvantages especially for low-income students.

Another critical component of educational activities is teachers. Teachers should have the necessary technological infrastructure, knowledge and pedagogical background to manage the process in order to manage teaching activities well during the emergency distance education course (Demirbilek, 2021). They should also be able to prepare the necessary teaching materials for the urgent distance education activities to be carried out and allocate time for this. While the OECD average for teachers not having enough time to prepare the necessary digital content is about 60%, this rate is about 85% in Turkey (OECD, 2020a). In this respect, it is seen that teachers in Turkey have many problems in terms of time. While the OECD average for teachers having the necessary technical knowledge and infrastructure is 65%, this rate is around 75% in Turkey (OECD, 2020a). Despite being above the OECD average, approximately 25% of teachers do not have the necessary technological equipment. This situation reveals the need to support teachers in this context (Lynch, 2020; Reich et al., 2020; Reimers & Schleicher, 2020; Worldbank, 2020). It does not seem easy for teachers to adapt to new online environments (Kong, 2020) because they lack experience in distance education (Lynch, 2020). Kong (2020) stated that teachers have problems with how to express themselves during distance education lessons; the language they use in the teaching process is inflexible and flat, which does not attract students' attention. For this reason, it is seen that teachers have problems in involving students in the lesson and it turns into a completely teacher-centered education (Bakker & Wagner, 2020; Kong, 2020).

Studies reveal that especially synchronous distance education applications cannot meet the expectations of the participants due to problems such as visual, sound, communication problems and low interaction in distance education applications (Kaleli Yılmaz & Güven, 2015; Demirbilek, 2021). In fact, Özkul & Aydın (2012) took the students' views on distance education and found that half of the students preferred blended education instead of face-to-face education or distance and distance education, and one-third. However, Barış (2015) found that university students' attitudes towards distance education were low. In Özgül and Uysal's (2016) study, in which they investigated student opinions on the practice of distance summer school, it was concluded that students found the practice of distance summer school more beneficial than the practice of formal summer school. Paydar and Doğan (2019) also revealed in their study that most pre-service teachers had a positive view of distance and open learning, found the course useful and were willing to take the course. Pre-service teachers stated that there may be situations where distance learning environments are advantageous and disadvantageous.

The worldwide pandemic has had many impacts on teaching and learning activities. More than 94% of students worldwide have been affected by the pandemic, which shows the extent of the pandemic's impact on education worldwide (Mohammed, 2022). In this process, teachers, students, institutions and parents, who are the stakeholders of education, have been involved in a new education process and have entered distance education courses outside of the face-to-face education activities they are used to and have experienced many problems (Poultsakis et al., 2021). These problems were sometimes caused by the technology infrastructure, and sometimes by

the negative emotions experienced by teachers, feelings of loneliness and communication problems with students.

The data for this study were collected at the end of the year when the COVID-19 pandemic emerged. At the time of data collection, all educational institutions were conducting compulsory courses in the form of distance education, asynchronous materials in the learning management system and synchronous live courses. The aim of this study is to determine the opinions of school administrators and teachers about the competence, changes, motivation and problems experienced in the online learning process and the distance education process.

## 2 Method

### 2.1 Model of the research

This research is a descriptive study conducted to reflect the specific feelings and thoughts of the participants. In this context, the model of the research is the scanning model. Survey studies are “the studies that aim to collect data to determine certain characteristics of a group” (Büyükoztürk et al., 2013).

### 2.2 Universe and sample

The personal characteristics of the participants are given in Table 1. Accordingly, 42.8% of the sample consisted of women, while 57.2% were men. Teachers constitute the largest group with 83.4% in terms of the tasks they perform, and in terms of the level of assignment, secondary school with 51.9%, primary school with 31.6%, high school with 14.4% and finally kindergarten with 2.1%. In terms of the branch variable, it is seen that the largest group consists of Turkish teachers, and the smallest group, with 1.6%, consists of music and philosophy group teachers. Finally, when looking at the sample in terms of professional seniority variable, it was stated that the largest group consisted of participants with a seniority between 31.6% and 1–5 years, and the smallest group consisted of participants with a seniority between 17.6% and 11–15 years.

### 2.3 Data collection tools

In this research, which aims to examine the views of school administrators and teachers on the concept of distance education, a form consisting of two parts was created in the online environment. In the first part, there is a personal information form asking about demographic characteristics. In the second part, they were asked to complete the distance education satisfaction survey. Prepared forms were sent via e-mail. The prepared form was kept open for one month. In the research, 187 school administrators and teachers working in Bingöl Province were reached.

**Table 1** Descriptive Statistics Regarding the Sampling

Variables		Frequency (f) Percent (%)	
Gender	Male	80	42.8
	Female	107	57.2
Task	Manager	17	9.1
	Assistant Director	14	7.5
	Teacher	156	83.4
Tasked Tier	Kindergarten	4	2.1
	Primary school	59	31.6
	Middle School	97	51.9
	High school	27	14.4
Branch	Physical education	8	4.3
	Guidance	11	5.9
	Classroom teaching	27	14.4
	Social studies	8	4.3
	Turkish language and literature	4	2.1
	Turkish	31	16.6
	Information technologies	13	7
	Philosophy	3	1.6
	Science	13	7
	Visual arts	8	4.3
	English	30	16
	Math	17	9.1
	Music	3	1.6
	Pre-school	7	3.7
Professional Seniority	Technology Design	4	2.1
	1–5 between years	59	31.6
	6–10 between years	43	23
	11–15 between years	33	17.6
	16–20 between years	34	18.2
	21 year and above	18	9.6

## 2.4 Data collection and analysis

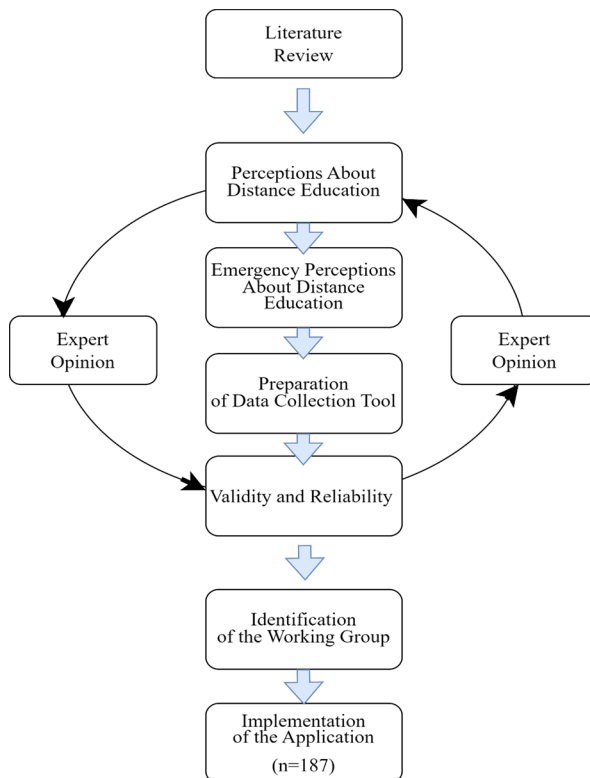
As with all scale tools in social science research, validity and reliability studies should be carried out for survey results. The validity of the questionnaires shows the power to obtain appropriate answers to the subject and question under investigation. It is stated that test-retest studies are widely used in reliability. Questionnaire development process takes place in four stages: defining the problem, writing the item (question), getting expert opinion and pre-application (Büyüköztürk et al., 2013).

Within the scope of the validity and reliability studies of the developed questionnaire, expert opinion was consulted for face and content validity. A pre-application was conducted to check whether the items were understandable and explanatory. Within the scope of reliability, it was determined that the correlations of the answers given to the items ranged between 0.77 and 0.96 as a result of the test-retest study conducted with a two-week interval. After these stages, the actual application was started with the questionnaire questions.

While analyzing the data obtained within the scope of the study, descriptive statistical analyzes were made in all questions and basic statistical values such as frequency, percentage, standard deviation, mode, and median were reported.

## 2.5 Sub-Problems of the Research.

1. Do you find the distance education conducted by your school sufficient?
2. What level of change has the Covid-19 outbreak caused in your life?
3. If you had to give a score between 0 and 7 for your general academic motivation before the Covid 19 epidemic, what score would you give?
4. If you had to give a score between 0 and 7 for your general academic motivation in the post-Covid 19 epidemic, how many points would you give?
5. Choose the one that suits you best from the opinions below regarding the suitability of the distance education method in the teaching of the courses at the school you are working in.
6. How often have you had problems with the following issues related to technology since the transition to distance education?



6.1. Students' deficiencies/inadequacies regarding distance education technologies/ applications.



**Table 2** Descriptive Statistics Results Regarding Whether Participants Find Distance Education Conducted by Their Schools Sufficient

	N	$\bar{X}$	Ss	Median	Mod	Min.	Max.
<b>Do you find the distance education conducted by your school sufficient?</b>	187	4.01	2.05	4.00	4.00	1.00	7.00

**Table 3** Descriptive Statistics Results Regarding the Level of Changes in the Lives of the Participants due to the Covid-19 Epidemic

	N	$\bar{X}$	Ss	Median	Mod	Min.	Max.
<b>How much has the COVID-19 pandemic changed your life?</b>	187	8.51	1.61	9.00	10.00	2.00	10.00

- 6.2. Uncertainties about which technology or application we will use.
- 6.3. I do not know how to use the necessary applications (e.g., Zoom, M. Teams, Google Meet) for distance education-communication.
- 6.4. Lack of internet access at my place of residence.
- 6.5. Using a different technology/application to teach each lesson.
- 6.6. The lack/use of functional tools (e.g., blackboard) we use in face-to-face education in digital environment.

### 3 Results

#### 3.1 Findings regarding the first sub-problem

The first sub-problem of the research is “Do you find the distance education conducted by your school sufficient?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 2.

When the values in Table 2 are examined, it is seen that the mode, median and mean values are remarkably close to each other. In this context, it was stated that the participants gave the same answers to both yes and no options to this question, and the average value was slightly close to the no option ( $\bar{X}=4.01$ ).

#### 3.2 Findings related to the second sub-problem

The second sub-problem of the research is “What level of change has the Covid-19 outbreak caused in your life?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 3.

By looking at the values in Table 3 and increasing the score obtained from the question asked, the option “completely changed”; Considering that the “never happened” option is approached with the fall; it is seen that the mean value of the data set is closer to the “completely changed” option ( $\bar{X}=8.51$ ).

**Table 4** Descriptive Statistics Results of the Participants' General Academic Motivation Levels Before the Covid-19 Epidemic

	N	$\bar{X}$	Ss	Median	Mod	Min.	Max.
<b>If you had to give a score between 0 and 7 for your general academic motivation before the Covid 19 epidemic, what score would you give?</b>	187	5.83	1.47	6.00	7.00	1.00	7.00

**Table 5** Descriptive Statistics Results of Participants' General Academic Motivation Levels After the Covid-19 Epidemic

	N	$\bar{X}$	Ss	Median	Mod	Min.	Max.
<b>If you had to give a score between 0 and 7 for your general academic motivation before the Covid 19 epidemic, what score would you give?</b>	187	3.75	1.61	4.00	3.00	1.00	7.00

### 3.3 Findings regarding the third sub-problem

The third sub-problem of the research was “If you had to give a score between 0 and 7 for your general academic motivation before the Covid 19 epidemic, how many points would you give?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 4.

Looking at the values in Table 4, it is seen that the mean value of the data set is closer to the “I am highly motivated” option ( $\bar{X}=5.83$ ).

### 3.4 Findings related to the fourth sub-problem

The fourth sub-problem of the research is “If you had to give a score between 0 and 7 for your general academic motivation in the post-Covid 19 epidemic, how many points would you give? expressed as”. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 5.

Looking at the values in Table 5, it is seen that the mean value of the data set is closer to the “I have no motivation” option ( $\bar{X}=3.75$ ).

### 3.5 Findings related to the fifth sub-problem

The fifth sub-problem of the research is “Which of the following views is most appropriate for you regarding the suitability of the distance education method in teaching the courses at the school you work at?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 6.

Considering the values in Table 6, the highest participation rate with 49.7% is “Distance education applications can be partially benefited from in the conduct of our school lessons”; secondly, 40.1% for the option “Distance education is not an appropriate method for conducting the courses in our school”; and lastly, it is seen that 10.2% belongs to the option “All of the courses in the school can also be conducted with distance education”.

**Table 6** Descriptive Statistics Results Regarding the Opinions of the Participants about the Appropriateness of the Distance Education Method in Teaching the Courses in the School they Work

	All the courses in the school can be conducted with distance education.		Distance education applications can be partially benefited from in the conduct of our school lessons.		Distance education is not an appropriate method for the conduct of the courses in our school.	
	f	%	f	%	f	%
Which of the following views is most appropriate for you regarding the suitability of the distance education method in teaching the courses at the school you work at?	19	10.2	93	49.7	75	40.1

**Table 7** Deficiency/Inadequacy Levels of Students in Distance Education Technologies/Applications Since the Transition to Distance Education

	N	$\bar{X}$	Ss	Level
<b>Students' Deficiencies/Inadequacies in Distance Education Technologies/Applications</b>	187	3.31	1.18	Sometimes

### 3.6 Findings regarding the sixth sub-problem

#### 3.6.1 Students' deficiencies/inadequacies regarding distance education technologies/applications

The sixth sub-problem of the research, the first sub-title “How often have you had problems with students' deficiencies/inadequacies regarding distance education technologies/applications since the transition to distance education?” expressed as. For this purpose, the descriptive statistical results of the answers given to the question asked are given in Table 7.

Looking at Table 7, it is stated that the average score of the participants in the item of deficiencies/inadequacies regarding distance education technologies/applications since the transition to distance education is 3.31. It is seen that the participants agree with this statement at the “sometimes” level.

#### 3.6.2 Uncertainties about which technology or application to use

The second sub-title of the sixth sub-problem of the research is “How often have you had problems with the uncertainties about which technology or application you will use since the transition to distance education?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 8.

When Table 8 is examined, it is seen that the average score of the participants in the item of uncertainty about which technology or application you will use since the transition to distance education is 2.72. It is seen that the participants agree with this statement at the “sometimes” level.

**Table 8** Levels of Uncertainty Regarding Which Technology or Application to Use Since Distance Education Started

	N	$\bar{X}$	Ss	Level
<b>Uncertainties Regarding Which Technology or Application to Use</b>	187	2.72	1.09	Sometimes

**Table 9** Levels of Not Knowing How to Use Required Applications (For example, Zoom, M. Teams, Google Meet) for Distance Education-Communication since the Transition to Distance Education

	N	$\bar{X}$	Ss	Level
<b>Not Knowing How to Use Applications Required for Distance Education-Communication (For example, Zoom, M. Teams, Google Meet)</b>	187	1.97	1.06	Rarely

**Table 10** Levels of Lack of Internet Access at the Place of Residence since Distance Education Started

	N	$\bar{X}$	Ss	Level
<b>Lack of internet access at the place of residence</b>	187	2.11	1.24	Rarely

### 3.6.3 Not knowing how to use applications required for distance education-communication (e.g., zoom, M. Teams, Google Meet)

The sixth sub-problem and the third sub-title of the research, “Since the transition to distance education, how often have you had problems with not knowing how to use the necessary applications for distance education-communication (e.g., Zoom, M. Teams, Google Meet)?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 9.

Looking at Table 9, it is stated that the average score of the participants is 1.97 in the item not knowing how to use the applications required for distance education-communication (e.g., Zoom, M. Teams, Google Meet) since the transition to distance education. It is seen that the participants agree with this statement at the level of “rarely”.

### 3.7 Lack of internet access at the place of residence

The sixth sub-problem and the fourth sub-heading of the study “How often have you had problems with the lack of internet access in your place of residence since the transition to distance education?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 10.

Looking at Table 10, it was stated that the average score of the participants was 2.11 in the item No internet access at the place of residence since distance education was started. It is seen that the participants agree with this statement at the level of “rarely”.

#### 3.7.1 Using a different technology/application to teach each lesson

The sixth sub-problem and the fifth sub-heading of the research “How often have you had problems with using a different technology/application to teach each lesson since

**Table 11** A Different Technology/Application Usage Levels for Teaching Each Lesson Since Distance Education Started

	N	$\bar{X}$	Ss	Level
<b>Using a different technology/application to teach each lesson</b>	187	2.16	1.01	Rarely

**Table 12** The Levels of Not Using/Using the Functional Tools (E.G., Blackboard) Used in Face-to-Face Education in the Digital Environment Since Distance Education Has Been Switched to

	N	$\bar{X}$	Ss	Level
<b>Absence/not being used of functional tools (e.g., blackboard) used in face-to-face education in digital environment</b>	187	2.87	1.37	Sometimes

the transition to distance education?” expressed as. For this purpose, the descriptive statistics results of the answers given to the question asked are given in Table 11.

When Table 11 is examined, it is stated that the average score of the participants in the item “Using a different technology/application to teach each lesson since distance education” was 2.16. It is seen that the participants agree with this statement at the level of “rarely”.

### 3.7.2 Absence/not being used of functional tools (e.g., blackboard) used in face-to-face education in digital environment

The sixth sub-problem and the sixth sub-title of the research “How often have you had problems with the lack of/not using the functional tools (e.g., blackboard) you use in face-to-face education in the digital environment since the transition to distance education?” expressed as. For this purpose, the descriptive statistical results of the answers given to the question asked are given in Table 12.

at Table 12, it was stated that the average score of the participants was 2.87 in the item that the functional tools (e.g., blackboard) that you have used in face-to-face education since the transition to distance education were not used in the digital environment. It is seen that the participants agree with this statement at the “sometimes” level.

## 4 Conclusion, discussion and recommendations

At the end of the research, it was determined that half of the participants did not find the distance education conducted in their schools during the epidemic period sufficient. Managers and teachers; 49.7% of them said that they can partially benefit from distance education in the conduct of the courses; 40.1% of them stated that it is not appropriate to conduct the courses with distance education; On the other hand, 10.2% stated that all the courses can be conducted with distance education.

There are studies in the literature that overlap with the findings of the research. Classroom teachers find the distance education conducted during the epidemic insufficient. If possible, it has been suggested to use a hybrid/blended education system in which formal education and distance education are conducted together, instead of completely distance education (Kantos, 2020). The teachers who teach simultane-

ously from a distance cannot provide enough guidance in this process; interaction with students is not sufficient (Başaran, Doğan, Karaoğlu, & Şahin, 2020); the level of participation in simultaneous courses is low; experiencing communication problems with students; and it has been determined that adequate social support cannot be provided to students (Genç, 2020).

In the research of Bakioğlu & Çevik (2020), 26.6% of science teachers think that they can complete the distance education curriculum, while 30.6% think that they cannot. 16% of the teachers stated that the curriculum could be partially completed. Most of the teachers who thought that the curriculum would not be enough stated that the distance education environment was not suitable, the duration of the lessons was insufficient and the level of participation of the students in the simultaneous lessons was low. Yılmaz (2020) stated that the activities conducted under the name of distance education are distance education activities and these activities cannot replace formal education.

One of the prerequisites for an education and training institution to be sufficient and effective in distance education is that employees are willing to conduct distance education activities (Canpolat, & Canpolat, 2020). The fact that teachers are inadequate and inexperienced in using distance education technologies and therefore have a negative view of distance education negatively affects students (Nenko, Kybalna, & Snisarenko, 2020; Genç, 2020).

At the end of the research, it was determined that school administrators and teachers had some uncertainties about which technology or application they would use since the transition to distance education. At the same time, they rarely had problems because they did not know which technologies/applications they should use in which course and how to use these technologies/applications. Although rare, the participants had problems connecting to the Internet during the distance education process. Since the teachers could not use some of the tools and materials they use in face-to-face education in the digital environment, they were sometimes worried about the efficiency of the lessons.

In the distance education process, teachers have problems in preparing and presenting sufficient and effective teaching materials for lessons (Genç & Gümrükçüoğlu, 2020). The limited number of course materials that can be used in the distance education process negatively affects the learning process of the students. For this reason, for a qualified distance education, the number and quality of digital course contents are increased and EBA etc. distance education systems should be enriched (Basaran et al., 2020). The most important problems faced by teachers in this process; It has been determined that it is caused by internet connection problems and not knowing how to use the hardware and software required for distance education. 58.6% of the teachers stated that students could not be reached during the distance education process and the students could not obtain sufficient information in this process, etc. They stated that they were worried about not being able to teach formally due to several reasons (Bakioğlu & Çevik, 2020).

The open-distance education system, which has been conducted professionally for nearly 40 years in our country, needs to be improved in terms of quantity and quality at all levels, from pre-school to higher education (Can, 2020). Schools should have a content developer for distance education, an assessment and evaluation specialist,

a quality monitoring and evaluation team, and a system administrator for planning distance education courses and coordination among employees. Every school should have the necessary internet infrastructure and technological devices for distance education (Can, 2020; Canpolat, & Canpolat, 2020; Salleh et al., 2020).

At the end of the research, it has been determined that some students do not have the technological devices to be used for distance education in the distance education process, and some students are insufficient in using distance education applications/programs. Due to the reasons arising from the students, the administrators and teachers had some problems in the distance education process. The literature on emergency distance education activities indicates that access to online resources is crucial for many students, but this turns into a disadvantage for students with little or no access to online resources (Dubey and Pandey, 2020; OECD, 2020b). This is related to students' lack of technological infrastructure in their homes to enable internet access and access to online resources and poses a vital problem for students living in rural areas and socio-economically disadvantaged students (Alvarez, 2020; Dubey and Pandey, 2020; Konstantopoulou et al., 2022; OECD, 2020c).

In Kantos (2020) and Salman (2020) studies, it has been determined that teachers use EBA mostly for sending homework and activities, but homework and activities sent from EBA are done by a limited number of students. In the research of Bakioğlu & Çevik (2020), it was stated that the motivation of teachers and students to participate in distance education is insufficient. According to Can (2020), students' information technology literacy levels are low. If students with low digital literacy cannot get support from someone else, they either do not participate in distance education at all or lose motivation in the face of technological problems. In the research of Başaran, Doğan, Karaoğlu and Şahin (2020), students and their parents stated that there are infrastructure problems in EBA live classes, that despite the high number of siblings studying in the same house, there is a television at home and the inadequacy of technological devices, etc. They stated that students could not attend distance education courses due to several reasons. Similarly, in Bakioğlu & Çevik (2020) and Kantos (2020) studies, it has been determined that some students do not have the internet and technological devices required for distance education, so their participation levels in synchronous and asynchronous courses are low.

At the end of the research, it was determined that the lives of administrators and teachers changed completely with the epidemic, and the participants, whose academic motivation was quite high in the pre-epidemic period, lost their motivation during the epidemic. In the literature, many studies have been conducted on the emergency distance education process carried out during the COVID-19 pandemic. These studies revealed that students experienced various difficulties in time management, motivation, and independent learning while taking courses with the distance education method, which they were not used to before, and the quality of the education they received deteriorated (Lee et al., 2021; Means & Neisler, 2021; Weidlich & Kalz, 2021). In addition, studies examining students' satisfaction with this process have also shown that students are not very satisfied with emergency distance education (Karadag et al., 2021; Şimşek et al., 2021; Turan & Gürol, 2020). Considering the widespread use of distance education worldwide and the low satisfaction of students,

the necessity of scientific research on distance education processes to design effective learning environments cannot be denied.

There are studies supporting the findings of the research in the literature. It has been determined that the professional satisfaction of teachers who think that distance education is ineffective and insufficient during the epidemic period has decreased (Bakioğlu & Çevik, 2020). In this process, teachers feel inadequate about controlling and supervising the teaching process (Kantos, 2020). Distance education limits teachers' communication with colleagues and students (Djalilova, 2020). Administrators and teachers, who come together in the teachers' room between classes in formal education, socialize in this process and can provide professional development by talking about the lessons and students. The motivation of the participants whose socialization needs are not met in distance education may decrease.

The stress level of teachers who stayed at home for a long time due to the epidemic and were worried that they would be infected with the virus increased (Al Lily, Ismail, Abunasser and Alqahtani, 2020). The frequent use of the internet and various distance education platforms in the emergency distance education process causes cyber security concerns for teachers. Negative news in the media about the theft of personal information and user accounts of some users over the Internet negatively affects the view of teachers who do not have enough knowledge about cyber security measures (Han, Demirbilek, & Demirtaş, 2021).

Teachers usually communicate with students via WhatsApp during the distance education period (Kantos, 2020). For this reason, especially branch teachers with a large number of lessons are included in many WhatsApp groups. With the request and question messages that can be received from the groups at any time of the day, the working hours of the teachers are spread throughout the day, including weekdays and weekends. Most teachers are uncomfortable with private messages and calls sent by students and parents, including late at night. When teachers who must instruct students, online lessons are added to the workload of their other responsibilities at home, teachers' stress and anxiety levels can increase even more.

Although the point of view of school administrators and teachers regarding the distance education process, which is tried to be conducted unprepared and urgently, is negative, this process has also made significant positive contributions (Han, Demirbilek, & Demirtaş, n.d. 2021). In the literature, there are studies that show positive changes in the lives of teachers through distance education. In a study on science teachers, 84% of teachers think that since they can teach even in difficult conditions, their self-confidence increases, they can improve themselves during the epidemic and affect their professional development positively (Bakioğlu & Çevik, 2020). It has been determined that with the sudden and compulsory transition to distance education, teachers' skills in using educational technologies have increased and they have improved themselves in preparing digital course contents. It has been determined that teachers adapt to distance education by frequently using EBA, which they have never used before, and educational videos and documents in EBA (Genç & Gümrükçüoğlu, 2020; Kantos, 2020; Bakioğlu & Çevik, 2020). In addition to the gains in the process, the increase in the research on distance education and the digital course contents produced during the epidemic period will make significant contributions to our education system in the post-epidemic period (Yıldırım, 2020).



## 5 Suggestions

When the findings of the study are evaluated together with the literature, the following suggestions can be made.

- Since the data were collected during the distance education process carried out during the COVID-19 pandemic, the possibility that the crisis environment created by the pandemic may affect the findings is also a limitation of this study.
- Similar remote guidance services organized by MEB for students with high levels of anxiety and stress during the pandemic can also be provided to school administrators and teachers.
- Education Information Network (EBA) infrastructure should be strengthened. In this way, teachers' search for using different platforms and the resulting concerns can be reduced.
- Teachers need to be pedagogically prepared for distance education and carry out the teaching process more effectively. For this purpose, it is thought that improving teachers' readiness for distance education through in-service trainings will pave the way for more effective execution of subsequent processes. Digital education content preparation trainings can be organized for administrators and teachers.
- Another vital issue is the positive and negative emotions experienced by teachers and students during the pandemic-era education process. It is a known fact that emotions play a decisive role in academic success. For this reason, it is necessary to investigate the causes of negative emotions in depth, reinforce the situations that bring out positive emotions, and thus ensure that teachers and students continue their education processes in a more positive environment. It is considered necessary to provide psychological support for both teachers and students.
- In conclusion, it is seen that there were interaction problems among students and between teachers and students during the pandemic period. Teachers had difficulty in motivating students to attend classes and social ties between students decreased. It is understood that the interaction was generally cold and one-way, from the teacher to the student. However, creating an interactive teaching environment is essential to help students construct their learning through experience rather than passive participation. Therefore, it is of great importance to plan better in times of distance education emergencies and create a program outline that will move students from passive participation to an interactive process.

**Data availability** Data sharing for this study is not applicable as no datasets were generated.

## Declarations

**Conflict of interest** Not Applicable.

## References

- Açıkgül, K., Sevimli, E., & Poçan, S. (2021). Matematik eğitiminde mobil öğrenme [Mobile learning in mathematics education]. In Yıldız, E. & Arpacı İ. (Eds.) *Matematik eğitiminde yenilikçi teknolojiler [Innovative Technologies in Mathematics Education]* (pp.143–162). Nobel Akademik Yayıncılık.
- Ağır, F. (2007). *Özel okullarda ve devlet okullarında çalışan ilköğretim öğretmenlerinin uzaktan eğitime karşı tutumlarının belirlenmesi. (Yayınlanmamış yüksek lisans tezi)*. Balıkesir: Balıkesir Üniversitesi, Fen Bilimleri Enstitüsü.
- Aguayo, J. M., Valdes, J., Cordoba, V. H., Najera, M., Vazquez, F. R., Munoz, E., & Lirios, G., C (2022). Digital activism in students of a university in central Mexico in the COVID-19 era. *Advances in Mobile Learning Educational Research*, 2(1), 297–307. <https://doi.org/10.25082/AMLER.2022.01.014>.
- Al Lily, A. E., Ismail, A. F., Abunasser, F. M., & Alqahtani, R. H. A. (2020). Distance education as a response to pandemics: Coronavirus and Arab culture. *Technology in Society*, 63, 101317.
- Altıparmak, M., Kurt, İ. D., & Kapıdere, M. (2011). *E-öğrenme ve uzaktan eğitimde açık kaynak kodlu öğrenme yönetim sistemleri*. XI. Akademik Bilişim Kongresi.
- Alvarez, A. V. (2020). The phenomenon of learning at a distance through emergency remote teaching amidst the pandemic crisis. *Asian Journal of Distance Education*, 15(1), 2020.
- Baker, S. C., Wentz, R. K., & Woods, M. M. (2009). Using virtual worlds in education: second life as an educational tool. *Teaching of Psychology*, 36(1), 59–64. <https://doi.org/10.1080/00986280802529079>.
- Bakioğlu, B., & Çevik, M. (2020). COVID-19 pandemisi sürecinde fen bilimleri öğretmenlerinin uzaktan eğitime ilişkin görüşleri. *Electronic Turkish Studies*, 15(4).109-130.
- Bakker, A., & Wagner, D. (2020). Pandemic: Lessons for today and tomorrow? *Educational Studies in Mathematics*, 104(1), 1–4. <https://doi.org/10.1007/s10649-020-09946-3>.
- Bardakçı, S., & Keser, H. (2017). *Bilişim teknolojilerinin eğitime entegrasyonu*. Nobel Yayıncılık.
- Barış, M. (2015). Üniversite öğrencilerinin uzaktan eğitime yönelik tutumlarının incelenmesi: Namık Kemal Üniversitesi örneği. *Sakarya University Journal of Education*, 5(2), 36–46.
- Başaran, M., Doğan, E., Karaoğlu, E., & Şahin, E. (2020). Koronavirüs (Covid-19) pandemi sürecinin getirisi olan uzaktan eğitimin etkililiği üzerine bir çalışma. *Academia Eğitim Araştırmaları Dergisi*, 5(2), 368–397.
- Becker, H. J. (2000). Findings from the teaching, learning, and computing survey: Is Larry Cuban right? *Education Policy Analysis Archives*, 8(51), 1–31.
- Beldarrain, Y. (2006). Distance education trends: integrating new technologies to foster student interaction and collaboration. *Distance Education*, 27(2), 139–153. <https://doi.org/10.1080/01587910600789498>.
- Boucher, A. (1998). Information technology-based teaching and learning in higher education: a view of the economic issues. *Journal of Information Technology for Teacher Education*, 7(1), 87–111. <https://doi.org/10.1080/14759399800200023>.
- Bozkurt, A. (2017). Türkiye’de uzaktan eğitimin durumu, bugünü ve yarını. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi*, 3(2), 85–124.
- Bozkurt, A., & Sharma, R. (2020). Emergency remote teaching in a time of global crisis due to Coronavirus pandemic. *Asian Journal of Distance Education*, 15(1), 1–6.
- Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2013). *Bilimsel araştırma yöntemleri*. Pegem Akademi Yayıncılık.
- Can, E. (2020). Koronavirüs (Covid-19) pandemisi ve pedagojik yansımaları: Türkiye’de açık ve uzaktan eğitim uygulamaları. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi*, 6(2), 11–53.
- Canpolat, U., & Canpolat, N. Z. (2020). Uzaktan eğitim bağlamında e-hazır olma kavramının irdelenmesi. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi*, 6(3), 79–91.
- Cuban, L. (2006). Why can’t schools be like businesses? *School Administrator*, 63(2), 32–36.
- Dalgarno, B., Bishop, A. G., Adlong, W., & Bedgood, D. R. (2009). Effectiveness of a virtual laboratory as a preparatory resource for distance education chemistry students. *Computers and Education*, 53(3), 853–865. <https://doi.org/10.1016/j.compedu.2009.05.005>.
- Demirbilek, N. (2021). Satisfaction levels, communication situations, and difficulties encountered by university students regarding Distance Education. *Education and Urban Society*, 0(0), <https://doi.org/10.1177/00131245211042391>.
- Djalilova, K. M. (2020). Advantages and disadvantages of distance learning. *Наука и образование сегодня*, (7), 70–72.

- Dubey, P., & Pandey, D. (2020). Distance learning in higher education during pandemic: Challenges and opportunities. *The International Journal of Indian Psychology*, 8(2), 43–46. <https://doi.org/10.25215/0802.204>.
- Elyazgi, M. G. B., Mahrin, M. N., ri, Nor, N. Z., & Athar Imtiaz, M. (2014). Feasibility study of tablet PC acceptance among school children in Malaysia. *Journal Technology (Sciences and Engineering)*, 69(2), 39–44. <https://doi.org/10.11113/jt.v69.3103>.
- Eroğlu, F., & Kalaycı, N. (2020). Üniversitelerdeki zorunlu ortak derslerden yabancı dil dersinin uzaktan ve yüz yüze eğitim uygulamalarının karşılaştırılarak değerlendirilmesi. *Türk Eğitim Bilimleri Dergisi*, 18(1), 236–265.
- Erturgut, R. (2010). İnternet temelli uzaktan eğitimin örgütsel, sosyal, pedagojik ve teknolojik bileşenleri. *Bilişim Teknolojileri Dergisi*, 1(2), 79–85. <https://doi.org/10.17671/btd.49929>.
- Genç, M. F., & Gümrükçüoğlu, S. (2020). Koronavirüs (Covid-19) sürecinde İlahiyat Fakültesi öğrencilerinin uzaktan eğitime bakışları. *Electronic Turkish Studies*, 15(4), 9–30.
- Genç, S. (2020). Uzaktan eğitim uygulamalarının öğretmen görüşlerine göre incelenmesi. *International Journal of Innovative Approaches in Education*, 4(3), 101–107. <https://doi.org/10.29329/ijiae.2020.271.3>.
- Golden, C. (2020). Remote teaching: The glass half-full. Educause review. <https://er.educause.edu>
- Han, F., Demirbilek, N., & Demirtaş, H. (2021). Okul yöneticisi ve öğretmenlerin koronavirüs (Covid-19) salgını sürecinde yürütülen uzaktan eğitime ilişkin görüşleri. *Cumhuriyet International Journal of Education*, 10(3), 1168–1193.
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. Educause Review. <https://er.educause.edu>
- Isisag, K. U. (2012, November). The positive effects of integrating ICT in foreign language teaching. In *International Conference Proceedings. ICT for Language Learning*.
- Jin, Q. (2011). Distance education environments and emerging software systems: New technologies. *Information Science Reference*. <https://doi.org/10.1017/CBO9781107415324.004>
- Kantos, Z. E. (2020). Sınıf öğretmenlerinin uzaktan eğitim ile ilgili düşünceleri. 8. Uluslararası Bilimsel Araştırmalar Kongresi-Sosyal ve Eğitim Bilimleri, 67.
- Karadağ, E., Su, A., & Ergin-Kocaturk, H. (2021). Multi-level analyses of distance education capacity, faculty members' adaptation, and indicators of student satisfaction in higher education during COVID-19 pandemic. *International Journal of Educational Technology in Higher Education*, 18(57), 1–20. <https://doi.org/10.1186/s41239-021-00291-w>.
- Katsaris, I., & Vidakis, N. (2021). Adaptive e-learning systems through learning styles: a review of the literature. *Advances in Mobile Learning Educational Research*, 1(2), 124–145. <https://doi.org/10.25082/AMLER.2021.02.007>.
- Keegan, D. (2003). *Foundations of distance education*. Routledge Falmer Tylor & Francis Group.
- Kong, Q. (2020). Practical exploration of home study guidance for students during the covid-19 pandemic: A case study of Hangzhou liuxia elementary school in Zhejiang province, China. *Science Insights Education Frontiers*, 5(2), 557–561. <https://doi.org/10.15354/sief.20.rp026>.
- Konstantopoulou, G., Dimitra, V., Papakala, I., Styliani, R., Vasiliki, T., Ioakeimidi, M., Niros, A. D., Boutis, M., & Iliou, T. (2022). The mental resilience of employees in special education during the-pandemic Covid-19. *Advances in Mobile Learning Educational Research*, 2(1), 246–250. <https://doi.org/10.25082/amlr.2022.01.008>.
- Lee, K., Fanguy, M., Lu, X. S., & Bligh, B. (2021). Student learning during COVID-19: It was not as bad as we feared. *Distance Education*, 42(1), 164–172. <https://doi.org/10.1080/01587919.2020.1869529>.
- Liu, Y., & Ginther, D. (1999). Cognitive styles and distance education. *Online Journal of Distance Learning Administration*, 2(3), 1–17.
- Lynch, M. (2020). E-Learning during a global pandemic. *Asian Journal of Distance Education*, 15(1), 189–195.
- Maryam, K., Ahmad, H., Elham, H., & Nasrin, K. (2013). The use of ICT and technology in language teaching and learning. *Applied Science Reports*, 10(2), 46–48.
- Means, B., & Neisler, J. (2021). Teaching and learning in the time of COVID: the student perspective. *Online Learning*, 25(1), 8–27. <https://doi.org/10.24059/olj.v25i1.2496>.
- Mohammed, D. Y. (2022). The web-based behavior of online learning: an evaluation of different countries during the COVID-19 pandemic. *Advances in Mobile Learning Educational Research*, 2(1), 263–267. <https://doi.org/10.25082/amlr.2022.01.010>.
- Nenko, Y., Kybalna, N., & Snisarenko, Y. (2020). The COVID-19 Distance Learning: Insight from Ukrainian students. *Revista Brasileira de Educação do Campo*, 5, e8925–e8925.

- OECD. (2020a). *Learning remotely when schools close: how well are students and schools prepared?*. Insights from PISA.
- OECD (2020b). How do we re-open schools after the coronavirus pandemic? <https://oecdutoday.com>
- OECD (2020c). Education responses to covid-19: Embracing digital learning and online collaboration.
- Özarslan, Y. (2008). Uzaktan eğitim uygulamaları için açık kaynak kodlu öğrenme yönetim sistemleri. *XIII. Türkiye’de İnternet Konferansı* (pp. 55–60). ODTÜ.
- Özgül, E., & Uysal, Ö. (2016). Uzaktan yaz okuluna yönelik öğrenci görüşleri. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi*, 2(3), 130–150.
- Özkul, A. E., & Aydın, C. A. (2012). Öğrenci adaylarının açık ve uzaktan öğrenmeye yönelik görüşleri. *Akademik Bilişim*, 1–3.
- Papadakis, S. (2021). Advances in Mobile Learning Educational Research (A.M.L.E.R.): Mobile learning as an educational reform. *Advances in Mobile Learning Educational Research*, 1(1), 1–4. <https://doi.org/10.25082/AMLER.2021.01.001>.
- Paydar, S., & Doğan, A. (2019). Öğretmen adaylarının açık ve uzaktan öğrenme ortamlarına yönelik görüşleri. *Eğitim ve Teknoloji*, 1(2), 154–162.
- Pınar, M. A., & Akgül, G. D. (2020). The opinions of secondary school students about giving science courses with distance education during the Covid-19 pandemic. *Journal of Current Researches on Social Sciences (JoCreSS)*, 10(2), 461–486. <https://doi.org/10.26579/jocress.377>.
- Postholm, M. B. (2007). The advantages and disadvantages of using ICT as a mediating artefact in classrooms compared to alternative tools. *Teachers and Teaching: Theory and Practice*, 13(6), 587–599. <https://doi.org/10.1080/13540600701683531>.
- Poultsakis, S., Papadakis, S., Kalogiannakis, M., & Psycharis, S. (2021). The management of digital learning objects of natural sciences and digital experiment simulation tools by teachers. *Advances in Mobile Learning Educational Research*, 1(2), 58–71. <https://doi.org/10.25082/AMLER.2021.02.002>. <https://doi.org/10.25082/AMLER.2021.02.002>.
- Reich, J., Buttner, C. J., Fang, A., Hillaire, G., Hirsch, K., Larke, L., Littenberg-tobias, J., Napier, A., Thompson, M., & Slama, R. (2020). Remote learning guidance from state education agencies during the COVID-19 pandemic: A first look. <https://doi.org/10.35542/osf.io/437e2>
- Reimers, F. M., & Schleicher, A. (2020). A framework to guide an education response to the COVID – 19 Pandemic of 2020.
- Rovai, A. P., & Kirk, T., Barnum (2003). On-Line course effectiveness: an analysis of student interactions and perceptions of learning. *Journal of Distance Education*, 18(1), 57–73.
- Salleh, F. I. M., Ghazali, J. M., Ismail, W. N. H. W., Alias, M., & Rahim, N. S. A. (2020). The impacts of Covid-19 through online learning usage for tertiary education in Malaysia. *Journal of Critical Reviews*, 7(8), 147–149.
- Selwyn, N. (2007). The use of computer technology in university teaching and learning: a critical perspective. *Journal of Computer Assisted Learning*, 23(2), 83–94. <https://doi.org/10.1111/j.1365-2729.2006.00204.x>.
- Shih, T. K. (2002). Distance education technologies: current trends and software systems. *First International Symposium on Cyber Worlds*, 38–43.
- Şimşek, I., Küçük, S., Köse Biber, S., & Can, T. (2021). Online learning satisfaction in higher education amidst the Covid-19 pandemic. *Asian Journal of Distance Education*, 16(1), 247–261. <https://doi.org/10.5281/zenodo.5047848>.
- Slykhuis, D. A., Wiebe, E. N., & Annetta, L. A. (2005). Eye-tracking students’ attention to PowerPoint photographs in a science education setting. *Journal of Science Education and Technology*, 14(5–6), 509–520. <https://doi.org/10.1007/s10956-005-0225-z>.
- Turan, Z., & Gürol, A. (2020). Emergency transformation in education: stress perceptions and views of university students taking online course during the COVID-19 pandemic. *Hayef: Journal of Education*, 17(2), 222–242. <https://doi.org/10.5152/hayef.2020.20018>.
- UNESCO (2020). Policy brief: Education during COVID-19 and beyond. United Nations. [https://www.un.org/development/desa/dsp/wpcontent/uploads/sites/22/2020/08/sg\\_policy\\_brief\\_COVID-19\\_and\\_education\\_august\\_2020.pdf](https://www.un.org/development/desa/dsp/wpcontent/uploads/sites/22/2020/08/sg_policy_brief_COVID-19_and_education_august_2020.pdf)
- Veletsianos, G. (Ed.). (2010). *Emerging technologies in distance education*. AU Press. <https://doi.org/10.1080/09523987.2011.549680>.
- Ventura, P., & Martín-Monje, E. (2016). Learning specialized vocabulary through Facebook in a massive open online course. In *New perspectives on teaching and working with languages in the digital era*. <https://doi.org/10.14705/rpnet.2016.tislid2014.427>

- Weidlich, J., & Kalz, M. (2021). Exploring predictors of instructional resilience during emergency remote teaching in higher education. *International Journal of Educational Technology in Higher Education*, 18(43), 1–26. <https://doi.org/10.1186/s41239-021-00278-7>.
- Wenglinsky, H. (2005). *Using technology wisely: the keys to success in schools*. Teachers College Press.
- Worldbank (2020). Supporting teachers during the COVID-19 (coronavirus) pandemic. <https://blogs.worldbank.org/education/supporting-teachers-during-covid-19-coronavirus-pandemic>
- Yamamoto, G. T., & Altun, D. (2020). Coronavirus ve çevrimiçi (online) eğitimin önlenemeyen yükselişi. *Üniversite Araştırmaları Dergisi*, 3(1), 25–34. <https://doi.org/10.26701/uad.711110>.
- YEĞİTEK (2020). EBA ve canlı sınıf kullanım saatlerinde artış. <https://yegitek.meb.gov.tr>
- Yıldırım, K. (2020). İstisnai bir uzaktan eğitim öğretim deneyiminin öğrettikleri. *Alanyazın*, 1(1), 7–15.
- Yılmaz, M. (2020). Uzaktan eğitimin iyileştirilmesi: Salgın kaynaklı eğitim krizini aşmak için öneriler (Politika Notu: 2020/12). *İstanbul: İLKE İlim Kültür Eğitim Vakfı*

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.