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Always with me even from a distance: Teachers' technology usage skills before and after distance education

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Abstract

The aim of this research is to determine the teachers' skills of technology use before and after distance education. Semi-structured interview technique was used as qualitative research methods.. The multi-stage sampling method was used in the selection of the teachers participating in the research. Descriptive and content analysis techniques were used in the analysis process of the data obtained from the interviews with the teachers. Accordingly, teachers thought that technology is being frequently used in learning environments after the pandemic. They also stated that the application they use most in their courses is Education Information Network (EBA). According to the findings, it has been suggested that teachers should receive in-service training in online education.

1. Introduction

Distance education is generally known as education in the absence of the learning environment and the learner. The history of distance education dates back to the beginning of the 19th century, and in those years, students living in different cities were educated through letters (Simonson, Zvacek, & Smaldino, 2019). Later, in parallel with the development of technology, internet-based applications have become prominent in distance education, in which radio, television, and teleconference methods are used respectively. Accordingly, it can be said that distance education is a system that is carried out with the opportunities provided by technology in educational environments (Çetin, Cakiroglu, Baymış, & Ekiz, 2004; do Espírito Santo, André, da Fonseca Souza, de Souza, & de Almeida, n.d.; Sukarsih & Anthony, 2020). In a broader definition, distance education is an education model that is carried out with the help of appropriate technological tools, with a teacher in different environments, without the need for students to be in a formal and physical environment such as a school or classroom. (Agarwal, Chu, Kirschner, Lindemann & Wloch, 2020; Nikolov & Wloch, 2020).

Although transportation facilities are at a very good level today, it can be said that the traditional understanding is insufficient in terms of equality of opportunity in education. In addition, the traditional understanding is very inadequate in terms of offering various alternative programs. Alternatively, when you go to a particular school, you may not always encounter a teacher with the characteristics you prefer. In addition, students cannot participate in a program in line with their interests, abilities and needs. Considering these handicaps of traditional education, the reason why distance education is used especially

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in developed and developing countries can be explained as follows (Anisenko, 2020; Nilsson, 2021; Şahin, 2021; Şen, Atasoy, & Aydın, 2010):

- To be able to appeal to all age groups,
- To be able to offer the same opportunities and equality for every individual,
- Providing access to teachers and experts wherever they are,
- To meet the needs of students who cannot attend school for various reasons,
- To be able to offer teaching at student's pace and teaching methods appropriate for the student.

In addition to the ones given above, the other reasons for preferring distance education can be listed as providing the opportunity to use it during pandemic periods, increasing the quality of education, reducing costs, compensating for the physical inadequacies of schools, and lack of qualified teachers (de Oliveira et all., 2018; Özbay, 2015).

The new type of coronavirus that emerged in 2019 has affected the whole world, which was accepted as a pandemic by the World Health Organization (WHO) on March 11, 2020. The rapid transmission of the disease and the continuous increase in the number of patients and deaths have affected many areas; especially health, economy, social, education, and so on, and it still shows its effect as of March 2020 (Altın, 2020).

The fact that more than 1.5 billion students were educated at home with the closure of schools and universities during the COVID-19 pandemic (UNESCO, 2020) is an important indicator of how effective this process is on education (Alqraini & Alasim, 2021). Online learning that can be carried out without contact between people offers free learning platforms, interactive apps, and socialization opportunities (Murgatrotd, 2020; Subedi, Nayaju, Subedi, Shah, & Shah, 2020).

COVID-19, the biggest pandemic of the last century, has made educational circles a very worrying situation in terms of learning losses (Hargreaves,2021). In this process, some students could not continue face-to-face education for months and some for more than a year. Although most of the teachers experiencing the pandemic process think that distance education cannot replace face-to-face education (Hebebci, Bertiz, & Alan, 2020; Sutiah, Slamet, Shafqat, & Supriyono, 2020; Zhang et al., 2020), it is possible to say that it is the best under these conditions (Gagik, 2020; Ilham & Wibowo, 2021; Kavuk & Demirtaş, 2021).

While the distance education process offers significant effects/advantages in the continuation of education and training activities, various deficiencies have also occurred. In the distance education process, inequality of access to courses and content has been experienced (Bennett, Uink, & Cross, 2020), the learning process has been interrupted due to distance, and there have been millions of students who could not / do not participate in distance learning and thus were deprived of education (Arık, 2020; Balingit, 2021; Karadağ & Yücel, 2020; UNESCO, 2020). Studies have revealed significant deficiencies in students' literacy and mathematics skills, unsuccessful results in exams and lack of foreknowledge necessary for continuing to the next level (World Bank, 2021; Yılmaz, Güner, Mutlu, Doğanay, & Yılmaz, 2020). In order to eliminate these deficiencies, measures have been taken such as opening summer schools, extending school hours, canceling snow holidays and introducing additional courses when schools opened. (Breslin, 2021; Di Pietro, Biagi, Costa, Karpiński, & Mazza, 2020; Kuhfeld et al., 2020). However, contrary to the idea of learning loss brought by distance education, it has been stated that it has positive reflections due to the increase in opportunities and possibilities (Grytsenko, Borysenko, Sydorenko, Vashchuk, & Valuieva, 2021; Matsuda & Russell, 2021). For example, some students had the opportunity to play games by spending more time outside during the distance education process. However, learning has been positively impacted by the absence of peer bullying in the face-to-face learning environment and learning interruptions that can occur in the classroom (Idoiaga Mondragon, Berasategi Sancho, Dosil Santamaria, & Eiguren Munitis, 2021; Nathan et al., 2021; Pongutta, Kantamaturapoj, Phakdeesettakun, & Phonsuk, 2021; Seren & Özcan, 2021).

Teachers having no distance education experience before have had to teach during emergency distance education, which started due to the pandemic (Dhawan, 2020). For this reason, teachers have to deal with the rapid changes and developments in information technologies and how these developments affect daily life (Singh et al., 2020). Studies show that teacher qualifications are important factors affecting learning (Thoonen, Sleegers, Peetsma, & Oort, 2011; Vedder, Boekaerts, & Seegers, 2005). However, it has been stated that teachers' attitudes and behaviors towards distance education are the most important factors affecting learning in these environments (Yıldırım, Yıldırım, Çelik, & Karaman, 2014). At the same time, teachers' motivation towards the lesson (Baber, 2020) and their perceptions of distance education (Kırali & Alcı, 2016; Tao & Yeh, 2008) affect learning.

The pandemic process has revealed the importance of schools and teachers to the stakeholders of education such as educators, policy makers and society. It has been proven once again in the pandemic that there are skills that cannot be met with the efforts of families and that require teacher expertise. Considering that a self-developed and well-trained teacher positively affect effective learning, it is important to investigate the experiences and thoughts of the teacher about the process in pandemic conditions. It is important to reveal the process, change and transformation and experiences of teachers, who are one of the important stakeholders in this process where education processes are so affected, changed and transformed. However, the results of this study are expected to shed light on future studies for the effectiveness of distance education. Few studies on the subject in the literature mostly rely on student views in undergraduate and postgraduate education (B. Demir, Yılmaz, & Celik, 2021; Hewitt, 2020; Mahasneh, Al-kreimeen, Alrammana, & Murad, 2021; Öz, 2021) and teacher opinions (Basaran et al., 2021; Demir, & Kale, 2020; Halasa et al., 2020; Hjelsvold, Nykvist, Lorås, Bahmani, & Krokan, 2020; Juárez-Díaz & Perales, 2021; Özdoğan & Berkant , 2020; Van der Spoel, Noroozi, Schuurink, & van Ginkel, 2020). The participants in this study consist of teachers working in lower-level educational institutions.

In this context, the aim of this research is to determine the teachers' skills of technology use before and after distance education. For this purpose, answers to the following questions were sought;

1. How often did teachers use technology in the classroom before the Covid-19 pandemic?

2. How often do teachers use technology in the classroom after the Covid-19 pandemic?

3. Which technological applications do teachers use in their classrooms?

4. Which technological applications do teachers would like to learn in their classrooms?

5. What are the problems experienced by teachers in the distance education process?

6. What are the technological applications that teachers learn during the distance education process?

7. What are the ways of learning the technological applications that teachers learn during the distance education process?

8. Which technological applications do teachers enjoy in the distance education process?

9. What are the technological applications that teachers do not enjoy in the distance education process?

10. What are the teachers' suggestions for the widespread use of technological applications in schools?

2. Methodology

2.1. Research Model

In this study, which aims to determine teachers' skills of technology use before and after distance education, semi-structured interview technique was used as qualitative research methods. Due to the

option for debate, which allows for the clarification of difficulties and the emergence of new issues, semi-structured interviews are particularly well suited for gathering qualitative data (Marshall et al., 2015). Because the interview questions are predetermined, the semi-structured interview streamlines the interviewing process (Truter et al., 2021).

2.2. Study Group

The multi-stage sampling method was used in the selection of the teachers participating in the research. In the first stage of the multi-stage sampling method, criterion sampling which is one of the purposive sampling methods, was used. The main criteria adopted was that the teachers had started their jobs before the covid-19 global pandemic and therefore had been a teacher for at least 3 years. Convenience sampling method was used in the second stage. In this study, a total of 14 teachers working in the province of Balıkesir in the 2021-2022 academic year were interviewed. Information about the study group is presented in Table 1.

Table 1.

Information about the study group

Participant	Gender	Age	Professional seniority	Branch
1/(Ö1)	F	41	18 years	Classroom Teacher
2 /(Ö2)	F	46	24 years	Preschool
3/(Ö3)	F	38	16 years	Classroom Teacher
4/(Ö4)	F	38	17 years	Classroom Teacher
5/(Ö5)	M	38	15 years	Preschool
6/(Ö6)	M	35	11 years	Mathematics
7/(Ö7)	F	35	10 years	Classroom Teacher
8/(Ö8)	F	42	20 years	Classroom Teacher
9/(Ö9)	F	37	14 years	Classroom Teacher
10/(Ö10)	M	42	17 years	Classroom Teacher
11/(Ö11)	F	34	10 years	Information and Communications Technology (ICT) Teacher
12/(Ö12)	M	33	7 years	Classroom Teacher
13/(Ö13)	F	30	5 years	Preschool
14/(Ö14)	F	39	18 years	Preschool

When the demographic variables of teachers were examined, it was seen that 10 of them are women, 4 of them are men, their professional seniority was between 5 and 24 years (average=15.35) while their age is between 30 and 46 (average=37.71).

2.3. Data Collecting Tools

A semi-structured interview form developed based on the relevant literature was used to determine the teachers' views on technology use skills before and after distance education. 13 questions written to be used in the interview form were sent to the field experts. After the feedbacks obtained, there are 10 questions in the final form. Before the interview, the school principals were informed about the purpose of the research and it was stated that their personal information would not be shared with third parties. The interviews were carried out in the time periods suggested by the teachers to avoid overlapping with their lessons. Each interview with a teacher lasted between 25-30 minutes on average. In order to prevent data loss, teachers' opinions were recorded with a voice recorder after getting their permission.

2.4. Data Analysis

Descriptive statistics and content analysis techniques were used in the analysis process of the data obtained from the interviews with the teachers. The main aim was to reach the concepts and relationships that could explain the data collected in content analysis. Therefore, it was necessary to conceptualize the collected data first, organize it logically according to the emerging concepts, and determine the themes that explain the data (Yıldırım & Şimşek, 2005). The recordings of the interviews were transcribed one by one. The transcriptions were transferred to the computer, a separate file was opened for each question, the answers of the teachers were read many times, the percentages and frequencies were determined, coding was made and the categories were reached. Percentage and frequency were used in the analysis of the 1st, 2nd, 3rd, 4th, 6th and 7th questions in the interview form, and the content analysis technique was used in the analysis of the 5th and 8th questions. While developing the semi-structured interview form, a conceptual framework was created by reviewing the relevant literature in order to ensure validity in the research. The prepared interview form was presented to the expert opinions and it was given its final shape as a result of the feedbacks. Comparisons were made about the codes and categories reached in the research, repetitive and unnecessary coding was removed and new coding was added where necessary. It was thought that obtaining deeply focused data in this way contributed to the reliability of the research. Finally, the frequencies and percentages of each code and category were calculated in the study. In order to increase the credibility of the research, the principle of researcher diversity was taken as the basis. In addition, the rate of agreement between coders was determined as .94 in the study.

3. Findings and Discussions

In this section, the answers given by the teachers to the questions in the interview form were analyzed and presented in line with the aims of the research.

In the study, firstly, the opinions of the teachers about the frequency of using technology before Covid 19 in their classrooms were taken and the data obtained are presented in Table 2.

Table 2.

Frequency of teachers using technology in their pre-Covid 19 classrooms

Frequency of use	*f*
Rarely	7
Often	5
When necessary	2

When the data in Table 2 were examined, it was concluded that the teachers rarely used technology (f=7) in their classes before Covid 19.

Teachers' views on the findings are presented below:

> *S6. Before the pandemic, there was less use. With the pandemic, I realized how necessary distance education was, and we agreed the necessity of the internet and technological equipment (Rarely).*

> *P11. I can say that I have been using it quite actively since there were smart boards and the Internet (Frequently).*

In the second question of the research, the opinions of the teachers about the frequency of using technology in their classrooms since the Covid 19 process were taken and the data obtained are presented in Table 3.

Table 3.

Frequency of teachers using technology in their classrooms since the Covid 19 process

Frequency of use	*f*
Often	11
Sometimes	3

When the data in Table 3 were examined, it was concluded that the teachers frequently used technology (f=11) in their classes since the Covid 19 process.

Teachers' views on the findings are presented below.

> *S1. Technology has entered our lives more and more. I discovered new applications for remote interviews and course activities. (Often).*

> *P14. During the lockdown period, my frequency of using technology was very high, and when it returned to the normal period, the frequency of use decreased (Sometimes).*

In the third question of the research, the opinions of the teachers about which technological applications they used in their classrooms were taken and the data obtained are presented in Table 4.

Table 4.

Applications used by teachers in their classrooms

Applications	***f***
EBA	7
Okulistik	5
Morpa Kampüs	4
Online games	3
YouTube	3
Wordwall	2
Khan Akademy	1
Visnos	1
Codeweek	1
Animations	1
V fabrika	1
hp5	1
Web 2.0	1
Canva	1
code.org	1
Z-books	1
Videos	1
Vitamin	1
Powerpoint	1
Scratch	1
Kahoot	1
Padlet	1
Mentimeter	1

When the data in Table 4 were examined, it was concluded that teachers mostly used EBA (f=7), schoolistic (f=5), morpa campus (f=4) software in their classrooms.

Teachers' views on the findings are presented below.

> *S1. I use technology applications such as Morpa campus, Okulistik, Vitamin, Eba, Wordwall.*

> *P14. …Since there is a smart board in my classroom, I can use the activities and games that I have prepared with various applications. I prepare games with Wordwall and use it in my classroom, we code by using codeweek.*

In the fourth question of the research, the opinions of the teachers about what kind of technological applications they want to learn were taken and the data obtained are presented in Table 5.

Table 5.

Technological applications that teachers want to learn

Application	*f*
Coding	3
Web 2.0 tools	3
Educational games	2
Animation preperation	2
Educational videos	1
Nano technology	1
Drone technology	1
Microsoft teams	1
Video editing	1
Poster making	1
Microdoft Office applications	1
Excel	1

When the data in Table 5 were examined, it was concluded that the teachers mostly wanted to learn more about coding (f=3), Web 2.0 tools (f=3), educational games (f=2) animation preparation (f=2) software.

Teachers' views on the findings are presented below.

> *S5. I think that learning the educational applications that are games but teach with the games will add more things to me due to the teaching level I work in (Educational games).*

> *S9. I would like to learn about coding related applications (Coding).*

Table 6.

Teachers' views on whether there are problems in the distance education process

I had no problems (***f=3)***				
	Theme	Category	Code	*f*
I had problems (***f=11)***	Problem	Individual	Students do not know technological applications	4
			Student apathy	3
			Teachers' lack of use of technology	2
			Negative parental attitude	1
		Hardware	Lack of internet at home due to financial reasons	8
			Infrastructure based internet access	8
			Lack of technological material	6
		Educational	Challenges in Reaching the Objectives in distance education	1
			Not having as much fun as in class	1
			Failing to provide a learning climate	1

When the data in Table 6 were examined, it was concluded that the majority of the teachers (f=11) had problems in the distance education process. The opinions of teachers who have problems in the distance education process were named as the Problem theme and were organized under the categories of individual, hardware, and educational. In the individual category, teachers stated that students do not know technological applications; In the hardware category, teachers stated that there is no internet at home due to financial reasons and that there is no internet access in settlements due to infrastructure; In

the educational category, teachers consider that they cannot have enough fun compared to the classroom environment and they see the inability to adequately create a learning climate as important problems.

Teachers' views on the findings are presented below.

P8. We have students from 13 villages, but we had problems due to the lack of internet infrastructure in all of the villages and the fact that many of our students did not have technological equipment (I Had a Problem - Hardware).

P14. Yes, student apathy was my biggest problem (I had a problem-Individual).

S10. … it is difficult and limited to be able to gain the learning outcomes that should be obtained in pre-school education through distance education and to observe the development of children with distance education (I Had a Problem-Educational).

In the sixth question of the study, the opinions of the teachers about the new technological applications they learned and how they learned these applications were taken and the data obtained are presented in Table 7 and Table 8.

Table 7.

Technological applications learned by teachers

Applications	***f***
Morpa kampüs	6
Okulistik	4
Wordwall	3
Eba	3
Vitamin	2
Voki	1
Learning apps	1
Codeweek	1
Geogebra	1
Khan Akademi	1
Kahoot ,	1
Mentimeter	1
Visnos	1

When the data in Table 7 is examined; it has been concluded that Morpa campus (f=6) , Okulistik (f=4), Wordwall (f=3) and Eba (f=3) software are the technological applications that teachers have just learned.

Teachers' views on the findings are presented below.

S7. I met Vitamin and Khan Academy through EBA connection.

S13. I learned Wordwall, Kahoot, Mentimeter applications. I use it in my classes and projects.

Table 8.

Teachers' views on how they learn new applications

How it was learned	*f*
By researching	11
Via social media	7
Via friend	6
Via another app	4
Through trainings	4
Through their children	2

When the data in Table 8 were examined, it was concluded that the teachers learned the new technological applications mostly researching by themselves (f=11) and through social media (f=7).

Teachers' views on the findings are presented below.

S1. We can learn technological applications by creating synergy in the teacher environment and by following the innovations by researching with trial and error method (Doing research).

P8. I learned about Morpa Campus through my son when he started primary school (through his children).

P11. I learned Wordwall, Kahoot, Mentimeter applications in projects such as e-twinning (through Trainings).

In the seventh question of the research, the opinions of the teachers about the technological applications they liked and disliked were taken and the data obtained are presented in Table 9 and Table 10.

Table 9.

Views of teachers about their favorite technology applications

Favorite apps and usage reasons	***f***
***Morpa Kampüs**	**8**
Content richness	4
Ease of use	2
Interesting events	2
Interactivity	1
***Okulistik**	**7**
Content richness	4
Ease of use	2
Compatible with courses	1
Animations	1
Finding visual diversity	1
Interactive	1
***Wordwall**	**2**
Ease of use	2
Content richness	1
İnteractive	1
***Eba**	**2**
Measurement and evaluation richness	2
Ease of use	2
Content richness	2
İnteractive	1
***Kahoot**	**1**
Fun	1
***Z book**	**1**
Content richness	1

When the data in Table 9 were examined, it was concluded that the most favorite technological applications of the teachers were Morpa Campus (f = 8) and Okulistik (f = 7) applications, and the reason why they liked these applications was mostly the richness of content they provided.

Teachers' views on the findings are presented below.

S2. I have been using Morpa campus application for many years and I like it.

S6. I love the Kahoot app. At the end of the lessons. Sometimes I try to include it at the end of the lesson. It makes the lesson fun.

S9. I mostly use Okulistik. Because it contributes a lot in terms of content.

Table 10.

Opinions of teachers about technological applications that they do not like

Applications	***f***
***Eba**	**3**
It should be enriched	2
Having a complex structure	1
***Spotify**	**1**
It should be enriched	1

When the data in Table 10 were examined, it was stated that the technological applications that teachers didn't like were Eba (f=3) and Spotify (f=1) applications, and it was stated that the reason why they didn't like the applications was that these applications should be enriched in terms of content.

Teachers' views on the findings are presented below.

S3. I don't like the Spotify app. The archive could be larger.

S12. I want the primary school part of Eba to be developed a little more. Studies at the 2nd and 4th grade of primary school can be supported a little more.

Finally, teachers' suggestions were taken for the widespread use of technological applications in schools and the data obtained are presented in Table 11.

Table 11.

Suggestions of teachers for the widespread use of technological applications in schools

Theme	**Category**	Code	***f***
Suggestion	Development	Training for teachers	12
		Training for parents	1
	Management	Development of internet infrastructures	3
		MEB should allow web sites	1
	Material support	Technological material support	4
		Increasing the number of technological applications	1
		Affordable membership	1

The opinions of teachers on the widespread use of technological applications in schools were named as the Suggestion theme and were organized under the categories of development, management and material support. Within the category of development, teachers generally needs to be given training on

technological applications (f=12); In the category of management, teachers want the internet infrastructure to be developed throughout the country (f=3); Within the material support category, teachers offered suggestions for providing technological material support (f=4).

Teachers' views on the findings are presented below.

S5. In schools, especially the schools in the city centers, the average age of teachers is high and there is a negative attitude towards technology. Unfortunately, the lessons are taught with traditional methods. I would like to have serious face-to-face trainings for technological applications (Development-Training).

S12. Internet connection in schools should be maximized so that it can be used more efficiently. (Management-Internet infrastructure development).

P14. I would like Morpa Campus, Okulistik-style education applications for being more accessible, especially in terms of price and membership (Material-Affordable membership).

4. Conclusion and Suggestions

During the covid-19 pandemic process, the increase in the workload of teachers without a training on distance education created substantial problems, however, it was emphasized that socio-economic differences among students and other handicaps in students had negative effects on education (TEDMEM, 2020). In this study in which the opinions of teachers about the process in question were taken, it was determined that the teachers did not use technology frequently before the pandemic. There are studies supporting this result in the literature (Doğan, Çınar, & Seferoğlu, 2016; Kayaduman, Sırakaya, & Seferoğlu, 2011; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). Some teachers stated that even without technology, they could easily teach their lessons and achieve related gains (Karakaş & Doğan, 2017). However, according to a study by Hsu (2011), teachers should use ICT to make their classroom environments more flexible and productive (Hsu, 2011). It is thought that this will only happen if teachers learn to use technology and integrate it into the lessons effectively (Amhag, Hellström, & Stigmar, 2019; Uerz, Volman, & Kral, 2018; Van der Spoel et al., 2020).

According to the teachers' views on the frequency of using technology after the pandemic, technology is frequently used in learning environments. In recent years, it has been stated that teachers use technology more frequently in their lessons and this has increased after the pandemic (Aliyyah et al., 2020; Ardıç, 2021; Williamson, Eynon, & Potter, 2020). This can be explained by the fact that teachers are necessarily exposed to technology during the pandemic period and thus become familiar with technology.

When asked which technological applications teachers use in their lessons, they have stated that they mostly use EBA. In the studies conducted before the pandemic, it has been stated that teachers do not have enough information about EBA, EBA offers many educational features and advantages (Aktay & Keskin, 2016), there are many educational content, and the rate of using EBA is low (R. Demir & Murat, 2017). Kurtdere Fidan, Erbasan, & Kolsuz, 2016). The reasons for this are that teachers find the content in EBA appropriate (Sagir & Dal, 2021; Türker & Güven, 2016) and that EBA is easy to access.

Considering what kind of technological applications teachers want to learn, they mostly state that they would like to learn more about coding, educational games, and web 2.0 tools. This situation is in parallel with the results of the study of Avcı, Kula, & Haşlaman (2019). Teachers' willingness to learn and learning about related applications shows that they want to update themselves and are open to innovations. Teachers must have sufficient technological knowledge in order to use technology efficiently in education. (Doğru, Nurbanu, & Koçulu, 2017) At the same time, teachers who have grown up with technology should be willing to learn new technological applications in order to meet the needs of the age and to communicate

well with new generation students. Distance education has started to become an integral part of school life. Today, it has become a necessity to learn various technological applications by teachers.

The opinions of the teachers about the problems they experience in the distance education process are grouped under the categories of individual, hardware and educational. In the individual category, it is determined that students' ignorance of technological applications, students' indifference, and teachers' inadequacy of technological skills come to the fore. Studies having similar results have shown that students' lack of ICT literacy causes disruptions in the distance education process (TEDMEM, 2020). It can be said that students' indifference towards the lesson is a situation encountered before distance education (Gökyer & Doğan, 2016). However, it has been stated in the literature that parents are also indifferent to the distance education process (Haşıloğlu, Durak, & Arslan, 2020). It can be said that one of the reasons for the indifference of the students is the indifference of the parents. In the individual category, it has been observed that teachers have inadequate levels of technology use skills. Although some research in the literature claim that teachers have poor technological skill levels (Basaran et al., 2021; Dargut & Çelik, 2014; TEDMEM, 2020), other studies claim the opposite (Alonso, Plaza, & Orfali, 2019; Güneş & Buluç, 2017; Winter, Costello, O'Brien, & Hickey, 2021).

In the hardware category, it has been observed that there are a lack of internet access and technological material deficiencies due to financial and infrastructure reasons. Sağır and Dal (2021) stated in their study that teachers have problems in reaching their students during the distance education process. The fact that students have access problems due to these reasons (Avcı & Akdeniz, 2021; Doğan & Koçak, 2020; Erdemci & Elçiçek, 2021; Haşıloğlu et al., 2020; Sağır & Dal, 2021; Yılmaz et al., 2020) affects both the teaching process negatively and it prevents equality of opportunity in learning. This result confirms that the access problem is an important handicap in distance education.

In the educational category, teachers consider that they cannot have enough fun compared to the classroom environment and they see the inability to adequately create a learning climate as important problems. Teachers stated that interaction is low in distance education (Basaran et al., 2021; Demir, & Kale, 2020; Halasa et al., 2020; Hjelsvold et al., 2020; Juárez-Díaz & Perales, 2021; Özdoğan & Berkant, 2020; Van der Spoel et al., 2020) and they reported low motivation (Dayal & Tiko, 2020; Klapproth, Federkeil, Heinschke, & Jungmann, 2020; Reich et al., 2020; Truzoli, Pirola, & Conte, 2021). We can say that all they are all obstacles to learning.

It has been observed that the answers to the question of "the technological applications they learned together with emergency distance education during the pandemic process" are e Morpa Campus, Okulistik and Wordwall. There are studies supporting this result (Batmaz, Batmaz, & Kılıç, 2021; Erbaş, 2021; Pınar & Dönel Akgül, 2020). It has been stated that these applications are very useful in the distance education process (Özçelik, 2022). It has been observed that teachers have learned various applications such as Voki and Learning Apps in addition to these applications and have improved themselves in this regard.

We see that teachers learn new applications, they learn more by "doing research", "using social media" or "through their friends". We see that teachers who are open to innovations and give sufficient importance to the learning process in the distance education process take responsibility and realize their own learning through social media. It is one of the positive indicators for the future to determine that there are teachers who take responsibility for their own learning and are lifelong learners, which is one of the 21st century skills.

When we look at the applications that teachers like or find successful, we see that Morpa campus and Okulistik applications stand out in parallel with the applications they have learned. They stated that they like Morpa campus because of its richness of content, which is also stated by (Karataş, 2021), ease of use and interesting activities. The Okulistik application, on the other hand, is liked by the teachers due to its richness of content. The use of applications containing these elements that affect student-content interaction in distance education will increase the effectiveness of learning environments. However, it has been

determined that among the teachers there are those who do not like the EBA and Spotify applications. It has been determined that these applications should be enriched in terms of interactive content and updated by removing unnecessary content. In the studies, it is stated that the EBA content is not sufficient to meet the needs, and that the content in question should be professional, qualified and useful (Alabay & Taşdelen, 2017; Avcı et al., 2019; Dündar & Karaağaçlı, 2019).

It has been determined that the views of providing in-service training, improving internet infrastructures and technological material support on the dissemination of technological applications used in schools come to the fore. It has been stated in studies that it may be beneficial for teachers to receive in-service training on the use of technology and distance education tools (Arıbaş, Kartal, & Çağlar, 2012; Başaran et al., 2021). It is known that in-service training is not provided in our country during the pandemic process, and teachers receive support from ICT teachers. However, Hot & Fingerless (2016) state that the methods and techniques used in in-service training activities organized are not appropriate and the evaluation process is insufficient.

In line with these results, the following suggestions are presented for teachers and policymakers;

1. Teachers' use of ICT in their lessons should be supported by in-service training.

2. Technological applications offered to teachers should be qualified.

3. The interaction between learner-learner, learner-teacher, and learner-content in lessons should be increased.

4. Supportive training on the use of technological tools should be given to students in ICT classes.

5. Infrastructure and hardware support in accessing content and applications should be increased for students and thus equality of opportunity should be ensured.

6. It is necessary to take measures to increase the motivation of the learners by using the gamification in the lessons.

7. Although it is seen that the rate of EBA usage is at a good level, teachers who do not use EBA should be encouraged to use both EBA and other web 2.0 tools.

In the same direction, the following suggestions are presented for researchers;

1. More in-depth research can be done using quantitative and mixed methods.

2. The same research can be carried out with students and different samples.

References

Akdemir, O. (2010). Teaching math online: Current practices in Turkey. *Journal of Educational Technology Systems*, *39*(1), 47–64.

Aktay, S., & Keskin, T. (2016). Eğitim Bilişim Ağı (EBA) İncelemesi. *Eğitim Kuram ve Uygulama Araştırmaları Dergisi*, *2*(3), 27–44.

Alabay, A., & Taşdelen, V. (2017). Ortaöğretim öğretmenlerinin ve öğrencilerinin EBA (Eğitimde Bilişim Ağı) kullanımına ilişkin görüşleri üzerine bir araştırma. *İstanbul Aydın Üniversitesi Eğitim Fakültesi Dergisi, Özel Sayı*, 27–29.

Alqraini, F. M., & Alasim, K. N. (2021). Distance education for d/deaf and hard of hearing students during the COVID-19 pandemic in Saudi Arabia: Challenges and Support. *Research in Developmental Disabilities*, *117*, 104059. https://doi.org/https://doi.org/10.1016/j.ridd.2021.104059

Altın, Z. (2020). Covid-19 pandemisinde yaşlılar. *Tepecik Eğitim ve Araştırma Hastanesi Dergisi*, *30*(2), 49–57.

Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher educators' use of digital tools and needs for digital competence in higher education. *Journal of Digital Learning in Teacher Education*, *35*(4), 203–220.

Ardıç, M. A. (2021). Ortaöğretim öğretmenlerinin eğitimde teknoloji kullanımına yönelik tutumlarının incelenmesi 1. *Cumhuriyet International Journal of Education*, *10*(2), 649–675.

Arıbaş, S., Kartal, Ş., & Çağlar, İ. (2012). İngilizce öğretmenlerinin hizmet içi eğitim faaliyetlerine ilişkin görüşleri. *Milli Eğitim Dergisi*, *42*(195), 100–117.

Arık, B. M. (2020). Türkiye'de koronavirüsün eğitime etkileri-I. Eğitim Reformu Girişimi.

Avcı, & Akdeniz, E. C. (2021). Koronavirüs (Covid-19) salgını ve uzaktan eğitim sürecinde karşılaşılan sorunlar konusunda öğretmenlerin değerlendirmeleri. *Uluslararası Sosyal Bilimler ve Eğitim Dergisi*, *3*(4), 117–154.

Avcı, Ü., Kula, A., & Haşlaman, T. (2019). Öğretmenlerin öğrenme-öğretme sürecine entegre etmek istedikleri teknolojilere ilişkin görüşleri. *Acta Infologica*, *3*(1), 13–21.

Baber, H. (2020). Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19. *Journal of Education and E-Learning Research*, *7*(3), 285–292.

Balingit, M. (2021). Unprecedented numbers of students have disappeared during the pandemic. Schools are working harder than ever to find them. *Washington Post*.

Başaran, M., Ülger, I. G., Demirtaş, M., Elif, K., Geyik, C., & Vural, Ö. F. (2021). Uzaktan eğitim sürecinde öğretmenlerin teknoloji kullanım durumlarının incelenmesi. *OPUS Uluslararası Toplum Araştırmaları Dergisi*, *17*(37), 4619–4645.

Batmaz, O., Batmaz, M. C., & Kılıç, A. (2021). Covid-19 salgın döneminde sınıf öğretmenlerinin Hayat Bilgisi dersi öğretimine yönelik görüşleri. *Manas Sosyal Araştırmalar Dergisi*, *10*(3), 1665–1677.

Bennett, R., Uink, B., & Cross, S. (2020). Beyond the social: Cumulative implications of COVID-19 for first nations university students in Australia. *Social Sciences & Humanities Open*, *2*(1), 100083.

Breslin, T. (2021). *Lessons from lockdown: The educational legacy of COVID-19*. Routledge.

Çetin, Ö., Cakiroglu, M., Bayılmış, C., & Ekiz, H. (2004). Teknolojik gelişme için eğitimin önemi ve internet destekli öğretimin eğitimdeki yeri. *TOJET: The Turkish Online Journal of Educational Technology*, *3*(3).

Dargut, T., & Çelik, G. (2014). Türkçe öğretmeni adaylarının eğitimde teknoloji kullanımına ilişkin tutum ve düşünceleri. *Ana Dili Eğitimi Dergisi*, *2*(2), 28–41.

Dayal, H. C., & Tiko, L. (2020). When are we going to have the real school? A case study of early childhood education and care teachers' experiences surrounding education during the COVID-19 pandemic. *Australasian Journal of Early Childhood*, *45*(4), 336–347.

Demir, S., & Kale, M. (2020). Öğretmen görüşlerine göre, Covid-19 küresel salgını döneminde gerçekleştirilen uzaktan eğitim sürecinin değerlendirilmesi. *Electronic Turkish Studies*, *15*(8).

Demir, R., & Murat, M. (2017). Öğretmen adaylarının mutluluk, iyimserlik, yaşam anlamı ve yaşam doyumlarının incelenmesi. *OPUS Uluslararası Toplum Araştırmaları Dergisi*, *7*(13), 347–378.

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, *49*(1), 5–22.

Di Pietro, G., Biagi, F., Costa, P., Karpiński, Z., & Mazza, J. (2020). *The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets* (Vol. 30275). Publications Office of the European Union Luxembourg.

Doğan, D., Çınar, M., & Seferoğlu, S. S. (2016). "Her Çocuğa Bir Bilgisayar" projeleri ve FATİH projesi: Karşılaştırmalı bir değerlendirme. *SDU International Journal of Educational Studies*, *3*(1), 1–26.

Doğan, & Koçak, E. (2020). EBA sistemi bağlamında uzaktan eğitim faaliyetleri üzerine bir inceleme. *Ekonomi ve Sosyal Araştırmalar Dergisi*, *7*(14), 111–124.

Doğru, M., Nurbanu, Ş., & Koçulu, A. (2017). Sınıf öğretmenlerinin teknoloji kullanımına ilişkin öz-yeterlik algılarının çeşitli değişkenler açısından incelenmesi. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi*, *4*(12), 464–472.

Dündar, E., & Karaağaçlı, M. (2019). Öğretmenlerin EBA (Eğitim Bilişim Ağı) ile ilgili algılarının eğretilemeler aracılığıyla belirlenmesi. *R&S-Research Studies Anatolia Journal*, *2*(6), 247–259.

Erbaş, Y. H. (2021). Covid-19 salgını döneminde eğitim: İlkokuma yazma öğretiminde karşılaşılan sorunlar ve çözüm önerileri. *Ana Dili Eğitimi Dergisi*, *9*(2), 360–380.

Erdemci, Ö. Ü. H., & Elçiçek, Ö. Ü. M. (2021, 19-20 October). *Uzaktan Eğitim Sürecinde Karşılaşılan Engellerin Bilişim Teknolojileri Rehber Öğretmenleri Açısından Değerlendirilmesi.* [Conference presentation]. Uluslararası Uzaktan Eğitim Kongresi. Ankara. https://idec2021.asbu.edu.tr/tr.

Gökyer, N., & Doğan, B. (2016). İstenmeyen öğrenci davranışları ve nedenlerine ilişkin yönetici ve öğretmen görüşleri. *Fırat Üniversitesi Sosyal Bilimler Dergisi*, *26*(1), 93–106.

Halasa, S., Abusalim, N., Rayyan, M., Constantino, R. E., Nassar, O., Amre, H., … Qadri, I. (2020). Comparing student achievement in traditional learning with a combination of blended and flipped learning. *Nursing Open*, *7*(4), 1129–1138.

Hargreaves, A. (2021). What the COVID-19 pandemic has taught us about teachers and teaching. *Facets*. Canadian Science Publishing 1840 Woodward Drive, Suite 1, Ottawa, ON K2C 0P7.

Haşıloğlu, M. A., Durak, S., & Arslan, A. (2020). Covid-19 uzaktan eğitim sürecinde fen bilimleri şube rehber öğretmenlerinin gözünden öğretmen, öğrenci ve velilerin değerlendirilmesi. *Uluslararası Eğitim Bilim ve Teknoloji Dergisi*, *6*(3), 214–239.

Hjelsvold, R., Nykvist, S. S., Lorås, M., Bahmani, A., & Krokan, A. (2020). Educators' experiences online: How COVID-19 encouraged pedagogical change in CS education. In *Norsk IKT-konferanse for forskning og utdanning*.

Hsu, S. (2011). Who assigns the most ICT activities? Examining the relationship between teacher and student usage. *Computers & Education*, *56*(3), 847–855.

Idoiaga Mondragon, N., Berasategi Sancho, N., Dosil Santamaria, M., & Eiguren Munitis, A. (2021). Struggling to breathe: a qualitative study of children's wellbeing during lockdown in Spain. *Psychology & Health*, *36*(2), 179–194.

Juárez-Díaz, C., & Perales, M. (2021). Language teachers' emergency remote teaching experiences during the COVID-19 confinement. *Profile Issues in TeachersProfessional Development*, *23*(2), 121–135.

Karadağ, E., & Yücel, C. (2020). Yeni tip Koronavirüs pandemisi döneminde üniversitelerde uzaktan eğitim: Lisans öğrencileri kapsamında bir değerlendirme çalışması. *Yükseköğretim Dergisi*, *10*(2), 181–192.

Karakaş, H., & Doğan, A. (2017). Sınıf öğretmenlerinin sınıfta kullandıkları bilgi iletişim teknolojilerine yönelik olumsuz tutumları ve yaşadıkları sorunlar. *Hitit Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *10*(1), 629–652.

Karasar, N. (2003). *Bilimsel araştırma yöntemi*. Ankara: Nobel Yayın Dağıtım.

Karataş, F. (2021). *Morpa kampüs eğitim yazılımının ortaokul 7. sınıf öğrencilerinin cebir ve denklemler konusundaki akademik başarısına etkisi ve öğrenci görüşleri*. [Unpublished doctoral dissertation]. Kastamonu university.

Kavuk, E., & Demirtaş, H. (2021). Difficulties experienced by teachers in the distance education during COVID-19 pandemic/COVID-19 pandemisi sürecinde öğretmenlerin uzaktan eğitimde yaşadığı zorluklar. *E-International Journal of Pedandragogy/E-Uluslararası Pedandragoji Dergisi,* 1 (1), 55–7.

Kayaduman, H., Sırakaya, M., & Seferoğlu, S. S. (2011). Eğitimde FATİH projesinin öğretmenlerin yeterlik durumları açısından incelenmesi. *Akademik Bilişim*, *11*, 123–129.

Kırali, F. N., & Alcı, B. (2016). Üniversite öğrencilerinin uzaktan eğitim algısına ilişkin görüşleri. *İstanbul Aydın Üniversitesi Dergisi*, *8*(30), 55–83. Retrieved from https://dergipark.org.tr/tr/pub/iaud/issue/30078/324645

Klapproth, F., Federkeil, L., Heinschke, F., & Jungmann, T. (2020). Teachers' experiences of stress and their coping strategies during COVID-19 induced distance teaching. *Journal of Pedagogical Research*, *4*(4), 444–452.

Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. (2020). Projecting the potential impact of COVID-19 school closures on academic achievement. *Educational Researcher*, *49*(8), 549–565.

Kurtdere Fidan, N., Erbasan, Ö., & Kolsuz, S. (2016). Sınıf öğretmenlerinin Eğitim Bilişim Ağı'ndan (EBA) yararlanmaya ilişkin görüşleri. *Journal of International Social Research*, *9*(45).

Marshall, C., Brereton, P., & Kitchenham, B. (2015, April). Tools to support systematic reviews in software engineering: a cross-domain survey using semi-structured interviews. *Proceedings of the 19th international conference on evaluation and assessment in software engineering* (pp. 1-6).

Matsuda, M., & Russell, D. (2021). 2021. What we've lost and what we've learned. Retrieved from washingtonpost.com/education/2021/05/11/whats-weve-lost-and-what-weve-learned/.

Murgatrotd, S. (2020). *COVID-19 and online learning*. Canada: Alberta. https://doi.org/https://doi.org/10.13140/RG.2.2.31132.8512

Nathan, A., George, P., Ng, M., Wenden, E., Bai, P., Phiri, Z., & Christian, H. (2021). Impact of covid-19 restrictions on western Australian children's physical activity and screen time. *International Journal*

of Environmental Research and Public Health, *18*(5), 2583.

Ottenbreit-Leftwich, A. T., Glazewski, K. D., Newby, T. J., & Ertmer, P. A. (2010). Teacher value beliefs associated with using technology: Addressing professional and student needs. *Computers & Education*, *55*(3), 1321–1335.

Özbay, Ö. (2015). Dünyada ve Türkiye'de uzaktan eğitimin güncel durumu. *Uluslararası Eğitim Bilimleri Dergisi*, (5), 376–394.

Özçelik, Ş. (2022). Covid-19 pandemi sürecinde uzaktan eğitime ilişkin sınıf öğretmenlerinin görüşleri, yaşadıkları sorunlar ve çözüm önerileri. [Unpublished doctoral dissertation].Pamukkale University.

Özdemir, E. (2015). Tarama Yöntemi. M.Metin (Ed.). *Kuramdan uygulamaya eğitim bilimlerinde bilimsel araştırma yöntemleri*. Ankara: Pegem Akademi.

Özdoğan, A. Ç., & Berkant, H. G. (2020). Covid-19 pandemi dönemindeki uzaktan eğitime ilişkin paydaş görüşlerinin incelenmesi. *Milli Eğitim Dergisi*, *49*(1), 13–43.

Pınar, M. A., & Dönel Akgül, G. (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*, *10*(2), 461–486.

Pongutta, S., Kantamaturapoj, K., Phakdeesettakun, K., & Phonsuk, P. (2021). The social impact of the COVID-19 outbreak on urban slums and the response of civil society organisations: A case study in Bangkok, Thailand. *Heliyon*, *7*(5), e07161.

Reich, J., Buttimer, C. J., Coleman, D., Colwell, R. D., Faruqi, F., & Larke, L. R. (2020). What's lost, what's left, what's next: Lessons learned from the lived experiences of teachers during the 2020 novel coronavirus pandemic.

Sağır, Ş. U., & Dal, E. (2021). Pandemi sürecinde EBA platformuna yönelik sınıf öğretmenlerinin ve öğrencilerinin görüşleri. *Academia Eğitim Araştırmaları Dergisi*, *6*(2), 333–352.

Şahin, M. (2021). Dünyada ve Türkiye'de yükseköğretimde uzaktan eğitimin tarihi ve gelişim süreci. *Mustafa Kemal Üniversitesi Eğitim Fakültesi Dergisi*, *5*(7), 91–113.

Şen, B., Atasoy, F., & Aydın, N. (2010). Düşük maliyetli web tabanlı uzaktan eğitim sistemi uygulaması. *Akademik Bilişim*, *10*, 12.

Singh, C. K. S., Singh, T. S. M., Abdullah, N. Y., Moneyam, S., Ismail, M. R., Tek, E., … Singh, J. K. S. (2020). Rethinking english language teaching through telegram, whatsapp, google classroom and zoom. *Systematic Reviews in Pharmacy*, *11*(11), 45–54.

Sıcak, A., & Parmaksız, R. Ş. (2016). İlköğretim kurumlarındaki mesleki çalışmaların etkililiğinin değerlendirilmesi. *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, *17*(1).

Subedi, S., Nayaju, S., Subedi, S., Shah, S. K., & Shah, J. M. (2020). Impact of E-learning during COVID-19 pandemic among nursing students and teachers of Nepal. *International Journal of Science and Healthcare Research*, *5*(3), 68–76.

Tao, Y.-H., & Yeh, C.-C. R. (2008). Typology of teacher perception toward distance education issues–A study of college information department teachers in Taiwan. *Computers & Education*, *50*(1), 23–36.

TEDMEM. (2020). *COVID-19 sürecinde eğitim uzaktan öğrenme, sorunlar ve çözüm önerileri*. Ankara:

Türk Eğitim Derneği Yayınları.

Thoonen, E. E. J., Sleegers, P. J. C., Peetsma, T. T. D., & Oort, F. J. (2011). Can teachers motivate students to learn? *Educational Studies, 37*(3), 345–360.

Truter, P., Edgar, D., Mountain, D., & Bulsara, C. (2021). An emergency department optimized protocol for qualitative research to investigate care seeking by patients with non-urgent conditions. *Nursing open*, *8*(2), 628-635.

Truzoli, R., Pirola, V., & Conte, S. (2021). The impact of risk and protective factors on online teaching experience in high school Italian teachers during the COVID-19 pandemic. *Journal of Computer Assisted Learning*, *37*(4), 940–952.

Türker, A., & Güven, C. (2016). Lise öğretmenlerinin Eğitim Bilişim Ağı EBA projesinden yararlanma düzeyleri ve proje ile ilgili görüşleri. *Journal of Research in Education and Teaching*, *5*(1), 244-254.

Uerz, D., Volman, M., & Kral, M. (2018). Teacher educators' competences in fostering student teachers' proficiency in teaching and learning with technology: An overview of relevant research literature. *Teaching and Teacher Education*, *70*, 12–23.

UNESCO. (2020). Global Education Coalition. Retrieved from https://en.unesco.org/covid19/educationresponse/globalcoalition

Van der Spoel, I., Noroozi, O., Schuurink, E., & van Ginkel, S. (2020). Teachers' online teaching expectations and experiences during the Covid19-pandemic in the Netherlands. *European Journal of Teacher Education*, *43*(4), 623–638.

Vedder, P., Boekaerts, M., & Seegers, G. (2005). Perceived social support and well being in school; The role of students' ethnicity. *Journal of Youth and Adolescence*, *34*(3), 269–278.

World Bank. (2021). Urgent, Effective Action Required to Quell the Impact of COVID-19 on Education Worldwide. The World Bank.

Yıldırım, S., Yıldırım, G., Çelik, E., & Karaman, S. (2014). Perception of distance education students about distance education: A scale development study. *Journal of Research in Education and Teaching*, *3*(3), 365–370.

Yılmaz, E., Güner, B., Mutlu, H., Doğanay, G., & Yılmaz, D. (2020). Veli algısına göre pandemi dönemi uzaktan eğitim sürecinin niteliği. *Konya: Palet Yayınları*, *25*, 2020.