EKUAD JETPR
Eğitim Kuram ve Uygulama Araştırmaları Dergisi

ISSN 2149-7702
e-ISSN 2587-0718

DOI: 10.38089/ekuad.2021.82

Vol 7 (2021) Issue 3, 373-391

Primary School Teachers' Views on Learning Deficiencies in Mathematics Lessons in the Process of Distance Education

Veli TOPTAŞ[1], Feyyaz ÖZTOP[2]

Abstract

The purpose of this study is to determine the opinions of primary school teachers' on the topic of the reasons for students' learning deficiencies in mathematics lessons during distance education in COVID-19 Pandemic process and suggestions for eliminating these deficiencies. For this purpose, the research was carried out on the basis of phenomenology, one of the qualitative research designs. The research was conducted with the participation of 254 primary school teachers working in primary schools in Turkey in the 2020-2021 academic years. Data of the study was collected through a form consisted standardized open-ended questions. The data were analyzed by content analysis. The results of the study revealed that primary school teachers were found to link students ' learning deficiencies to the reasons associated with the structure of distance education, students, technical problems, family, planning, teachers and support services in the distance learning process carried out in conjunction with the COVID-19 pandemic. In order to address these learning deficiencies, it was found that they made various recommendations like planning, learning-teaching process, technical improvements, parents, student development, support services and improving the quality of teachers. In addition, it was determined that primary school teachers stated that learning deficiencies in the mathematics lessons during the distance learning process were caused by the lack of interaction and communication during COVID-19 pandemic and recommended face-to-face education as a solution for the deficiencies.

Key Words

COVID-19
Primary school teacher
Distance education
Mathematics lesson
Learning deficiency

About Article

Received: 07.05.2021
Accepted: 15.09.2021
Online Published: 31.12.2021

[1] Prof. Dr., Kırıkkale University, , Faculty of Education, Turkey, vtoptas@gmail.com https://orcid.org/0000-0001-8852-1852
[2] Gazi University, Institute of Educational Sciences, Turkey, feyyazoztop@gmail.com, https://orcid.org/0000-0002-3462-145X

Introduction

The COVID-19 pandemic, known to emerge in Wuhan, China, has spread rapidly worldwide. As of March 11, 2020, COVID-19 has been described as a pandemic by the World Health Organization (WHO, 2020). The spread of the COVID-19 pandemic in the world has adversely affected many areas, including education (Paudel, 2021). The COVID-19 pandemic has affected many students and schools (Bergdahl & Nouri, 2020). Moreover, in Turkey, education in schools has also been suspended as of March 16, 2020 (MEB, 2020a). Countries have sought urgent solutions to sustain educational activities while dealing with the pandemic and its effects in various areas. In Turkey, as in most countries, the decision to transition to distance education has also been taken due to the worsening of the course of the pandemic.

In distance education, while the teacher and the student are physically in separate places, communication between them occurs through various technologies (Koi-Akrofi, Owusu-Oware, & Tanye, 2020; Nazarova, Jalilova, Mukhamedova, & Rasulova 2021; Rumble, 1987). While letters were used in the first applications of distance education in the past (Kaya, 2002), it is seen that digital technologies are now widely used in distance education in the light of the latest developments. Also, in Turkey, learning-teaching processes began to be carried out employing digital tools with the transition to distance education during the COVID-19 outbreak period. Although distance education is seen as an approach for solving education problems (Beldarrain, 2006; Kaya, 2002), it can be said that new ones have been added to the known problems of distance education, and the difficulties encountered in this process have increased with the emergence of distance education during the COVID-19 pandemic period. In their research, Sarı and Nayır (2020) determined that problems occur under the categories of technology, health and others originating from partners related to the learning-teaching process in the field of education during the COVID-19 pandemic process by examining the reports of Economic Development and Cooperation Organization, United Nations Educational, Scientific and Cultural Organization and World Bank Institutions. In some other studies (Düzgün & Sulak, 2020; Er Türküresin, 2020; Karaca, Karaca, Karamustafaoğlu, & Özcan, 2021), it was determined that distance education practices during the COVID-19 outbreak period were not found to be very effective. The problems encountered and the process not functioning effectively enough lead to the fact that students cannot reach the gains at the lessons' targeted level, which causes learning deficiencies in the students.

Lack of learning in a particular subject will bring failure in that subject as well as causing negativities. While students who do not have a learning deficiency learn the following subjects more easily, students having learning deficiency need more time and effort while learning the subject (Köse, 2007). In order to bring education to a better level, it is necessary to replace the missing structures in children (Örs, 2019). In this context, it can be said that the learning gap of students should be taken into account—one of the lessons in which students' learning deficit is considered necessary in mathematics. Mathematics is a science in which individuals are intertwined in their entire academic life. Today, almost all professions require more or less mathematics and mathematical thinking (Olkun & Toluk Uçar, 2014). In national and international exams (MEB, 2019; MEB, 2020b; MEB, 2020c), it is seen that the average of mathematics points is low. Thus, it is essential to remove the obstacles to effective mathematics teaching and to eliminate learning deficiencies during the COVID-19 pandemic, where educational activities are carried out remotely, in order to keep the performance high in a mathematics course, which has a vital role in the academic and professional lives of individuals. Especially, acquiring targeted learning outcomes in primary school is considered essential both for this level and for students' future life because of the level at which basic mathematical knowledge and skills are acquired and attitudes are formed. In this direction, researches to eliminate the learning deficiencies in mathematics lessons in the distance education process, which started to be carried out compulsorily at the primary school level with the COVID-19 pandemic, gain importance.

With the emergence of the COVID-19 outbreak, it is seen that there are researches on digital education activities with regards to primary school level (Altıntaş Yüksel, 2021; Ayaz, 2021; Baran & Sadık, 2021a; Baran & Sadık, 2021b; Batmaz, Cevahir Batmaz, & Kılıç, 2021; Bulut & Susar Kırmızı, 2021; Brako & Essel, 2020; Demir & Özdaş, 2020; Diana, Suhendra, Yohannes, & Sukma, 2021; Erbaş, 2021; Erol & Erol, 2020; Fidan, 2020; Gezen & Efendioğlu, 2021; Gupta & Gupta, 2020; İnci Kuzu, 2020; Jamilah, Sukitman, & Fauzi, 2021; Günbaş & Gözükük, 2020; Karabudak, 2020; Kargın

& Karataş, 2021; Kesik & Baş, 2021; Kızıltaş & Çetinkaya Özdemir, 2021; Koç, 2021; Konca & Çakır, 2021; Korucuk, 2020; Okatan & Tagay, 2021; Kurt, Kandemir, & Çelik, 2021; Özcan & Saydam, 2021; Özden & İlgar, 2021; Pozas, Letzel, & Schneider, 2021; Putri et al., 2020; Rahmaini, 2021; Rasmitadila et al., 2020; Sakallı, Altınay, Altınay, & Dağlı, 2021; Sarışık, Uslu, Sarışık, & Uslu, 2021; Saygı, 2021; Sirem & Baş, 2020; Uğur Göçmez & Ünal, 2021; Uluçınar Sağır & Dal, 2021; Usta & Dönmez, 2021; Uysal & Kısa, 2021; Yadigar & Yadigar, 2021; Yurtbakan & Akyıldız, 2020) and mathematics lessons (Almarashdi & Jarrah, 2021; Cassibba et al., 2021; Das, 2021; Erduran & İnce Muslu, 2020; Irfan, Kusumaningrum, Yulia, & Widodo, 2020; Kamsurya, 2020; Kilit & Güner, 2021; Kuzu, 2020; Mailizar, Almanthari, Maulina, & Bruce, 2020; Marbán, Radwan, Radwan, & Radwan, 2021; Marpa, 2021; Maulina & Bruce, 2020; Mulenga & Marbán, 2020; Panaoura, 2020; Tezer & Cumhur, 2020; Tremblay & Delobbe, 2021; Wijaya, 2021; Xie, Xiao, Hou, Liu, & Liu, 2021). However, a study that sheds light on learning deficiencies of primary school students in mathematics lessons in the distance education process carried out due to the COVID-19 outbreak in Turkey was not observed. By determining the reasons for the primary school mathematics lesson learning deficiencies and suggestions on this subject, it can be ensured that both the existing learning deficiencies of the students are eliminated, and the learning deficiencies that will arise in case of restarting distance education in emergencies that will be encountered in the future can be prevented. Teachers' opinions, who play a crucial role in the learning-teaching process and are the key to success, which they will share by their experiences, are considered necessary. These opinions can provide important essential on the steps to be taken to identify and eliminate the causes of lesson learning deficiencies in the distance education process due to COVID-19 outbreak. In this context, the study aims to examine the opinions of primary school teachers regarding the reasons for students' learning deficiencies in mathematics lessons and their suggestions to overcome these deficiencies in the distance education process carried out due to the COVID-19 pandemic. For this purpose, answers to the following questions were sought in the study:

1. What are the opinions of primary school teachers regarding students' learning deficiencies in mathematics lessons in the distance education process due to the COVID-19 pandemic?

2. What are the suggestions of primary school teachers for eliminating the learning deficiencies of students in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic?

Method

Research Model

This research was carried out on the basis of phenomenology, one of the qualitative research designs. The qualitative research designs are concerned with the way participants' make sense of their experiences and the facts (Merriam & Tisdell, 2016). Phenomenology focuses on the facts that are aware of but do not have an in-depth and detailed understanding (Yıldırım & Şimşek, 2018). In this study, the reasons for students' learning deficiencies in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic and the suggestions to eliminate these deficiencies were examined according to the opinions of primary school teachers involved in the distance education process.

Study Group

Two hundred fifty-four primary school teachers working in various primary schools in Turkey formed the research study group. Criterion sampling, one of the purposeful sampling methods, was used to determine the study group. In the criterion sampling method, units that meet the predetermined criteria are included in the sampling (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2016; Mertens, 2010). In this study, primary school teachers who stated that their students had a learning deficiency in the mathematics lesson in the distance education process due to the COVID-19 pandemic were used as a criterion. The primary school teachers who were reached for this purpose were first asked whether their students had a learning deficiency in the mathematics lesson or not. The teachers who answered yes or partially yes answered the open-ended questions. Answers received from teachers are given in figure 1.

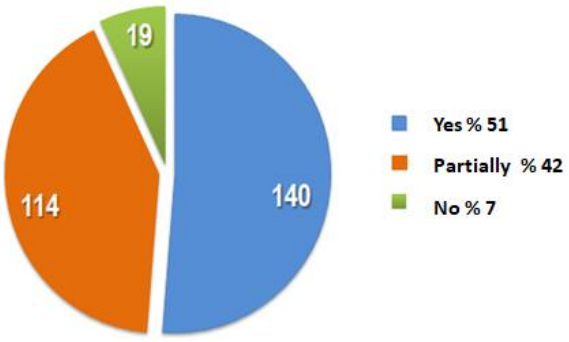

Figure 1. The opinions of primary school teachers about whether students have learning deficiencies in mathematics lesson in the distance education process or not

As seen in Figure 1, 254 primary school teachers (Yes: 140; Partially: 114; No: 114) were included in the study because of stating that their students had a learning deficiency in mathematics lesson in the distance education process carried out due to the COVID-19 pandemic.

Data Collection Tools

An interview form consisting of standardized open-ended questions was used as a data collection tool in the study. The questions prepared for standardized open-ended interviews are finalized questions in advance (Patton, 2015). In the interview form created for this study, there were two questions aimed at determining the opinions of primary school teachers regarding the reasons for students' learning deficiencies in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic and their suggestions to eliminate these deficiencies. The questions were created by benefiting from the opinions of field experts.

Data Collection Process

The data were collected in the 2020-2021 academic year. The correspondence technique was used for data collection. In the correspondence technique, data is collected through written communication (Karasar, 2019). The data is collected through online tools. The forms containing the questions were delivered to primary school teachers through a platform. The primary school teachers also filled in the forms that were given to them online. The researcher accessed the answers given through this platform.

Analysis of Data

The analysis of the data obtained from the research was carried out with content analysis. Content analysis is based on the principle of gathering similar data within the framework of specific concepts and themes and arranging and interpreting them in a way that the reader can understand (Yıldırım & Şimşek, 2018). Cohen, Manion, and Morrison (2007) define content analysis as the process of summarizing and reporting the messages contained in the actual contents of written data. The data obtained for content analysis in the study were categorized by coding, and then these categories were classified and named (Merriam & Tisdell, 2016).

Credibility and transferability are considered essential for validity in studies (Merriam & Tisdell, 2016; Yıldırım & Şimşek, 2018). In this context, suitable participants were reached for validity in the study, the data obtained from the teachers were coded and reviewed by two different researchers which are professionals in mathematics education, direct quotations from the participants' opinions were also included, and the quotations were coded as T1, T2. For the reliability of the research, care was taken to avoid deviations and changes in meaning during coding, the codings were reviewed, and the consistency was calculated by making comparisons between the independently made codings (Gibbs, 2007). In the calculation of the consistency, the reliability formula (Reliability = Agreement / (Agreement + Disagreement) proposed by Miles and Huberman (1994) was used. As a result of the calculation, the agreement value between the coders was at an acceptable level of 86% (Miles, Huberman, & Saldaña, 2014; Yıldırım & Şimşek, 2018).

Findings

In this section, the findings obtained from the analysis of the research data are included.

Findings regarding students' learning deficiencies in mathematics lessons in the distance education process were carried out due to the COVID-19 pandemic.

The opinions of primary school teachers regarding the reasons for the learning deficiencies experienced by students in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic were analyzed by content analysis. The findings obtained are given in Table 1.

Tablo 1. The opinions of primary school teachers regarding the reasons for the student's learning deficiencies in mathematics lessons in the distance education process

Categories	**Sub-categories**	f
Reasons originating from the nature of distance education	Lack of interaction and communication	66
	The difficulty of performing measurement and evaluation	28
	Difficulty in concentrating on the lesson	24
	Lack of material	19
	Difficulty in receiving feedback	16
	The difficulty of embodying abstract mathematics	14
	The inability of learning by practicing and experiencing	13
	Difficulty in practicing	11
	Usage of limited methods and techniques compared to traditional education	10
	Remaining affective features in the background	10
	The limitation of the sense organ addressed	9
	Difficulty in maintaining classroom management and discipline	8
	The negativity of prolonged exposure to digital tools	8
	The difficulty of taking care of students one by one	6
	The difficulty of considering different student styles	6
	Distraction due to other applications in the digital tools	6
	The difficulty of taking different student levels into account	3
	The difficulty of instant correction	2
	Lack of peer assistance in lessons	1
	The difficulty of writing mathematical expressions digitally	1
Total		261
Reasons originating from the student	Absence of students in the lessons	22
	Low motivation in students	17
	Students being indifferent	11
	Students not reinforcing what they have learned	9
	Students watching the lesson in a passive way	8
	Weakness of digital skills in students	7
	Reluctance of students	7
	Students not feeling responsible	3
	Poor readiness of students	2
	Perceiving the process as a holiday	2
	Abstention of students	1
	Prejudice in students	1
	Anxiety in students	1
Total		91

Tablo 1. The opinions of primary school teachers regarding the reasons for the student's learning deficiencies in mathematics lessons in the distance education process (Continued)

Categories	**Sub-categories**	f
Reasons originating from technical problems	Connection (internet) problems	30
	Lack of hardware	17
	Impossibility of acquiring technological tools	12
	Problems in logging into online education platforms	7
	Insufficiency of digital lesson materials	1
	Power cut	1
Total		68
Reasons originating from the family	Parents not providing the necessary support	17
	Indifference of parents	15
	Failure to provide a suitable learning environment at home	12
	Presence of distracting stimuli in the home environment	8
	The intervention of family members during the lesson	4
	Parents not cooperating with the teacher	2
	Family members doing the homework of students	1
Total		59
Reasons originating from planning	Short lesson period	24
	Learning outcomes being in a large number	7
	Absence of compulsory school attendance	3
	Implementation of the current program	2
Total		36
Reasons originating from the teacher	The poor digital skill of teachers	2
	Strict behavior of teachers	1
	Prejudice of teachers	1
Total		4
Reasons originating from the insufficiency of support services	Not being informed	1
	Insufficiency of technical support	1
Total		2

When Table 1 is examined, it is seen that the opinions of primary school teachers regarding the reasons for the students' learning deficiency in the mathematics lesson in the distance education process carried out due to the COVID-19 pandemic are collected in seven categories as reasons originating from the nature of distance education, students, technical problems, family, planning, teachers and insufficiency of support services. According to primary school teachers, the reasons originating from the nature of distance education are considered from the most to the least as lack of interaction and communication (f = 66), of performing measurement and evaluation (f = 28), difficulty in concentrating on the lesson (f = 24), lack of material (f = 19), difficulty in receiving feedback (f = 16), difficulty in embodying abstract mathematics (f = 14), inability of learning by practising and experiencing (f = 13), difficulty in practicing (f = 11), usage of limited methods and techniques compared to traditional education (f = 10), remaining of affective features in the background (f = 10), the limitation of the sense organ addressed (f = 9), difficulty in maintaining classroom management and discipline (f = 8), negativity of prolonged exposure to digital tools (f = 8), difficulty of taking care of students one by one (f = 6), difficulty of considering different student styles (f = 6), distraction due to other applications in the digital tools (f = 6), difficulty of taking different student levels into account (f = 3), difficulty of instant correction (f = 2), lack of peer assistance in lessons (f = 1) and difficulty of writing mathematical expressions digitally (f = 1). Some quotations from the opinions of primary school teachers regarding the category of reasons arising from the nature of distance education are given below.

"In distance education, it becomes difficult for students to embody, because close contact is not provided, the appropriate teaching method and technique for the student cannot be chosen..." (T13)

"I think the fact that distance education does not appeal to the unique learning style of each student (visual, auditory, tactile, etc.), that there is no immediate feedback, correction, that active elements such as motivation cannot be used, and that studies that evaluate learning cannot be done immediately during and at the end of the process cause students to have learning deficiencies. . " (T44)

"Not being able to supervise the students in front of the screen, the existence of students entering the game instead of entering the lesson even they have the opportunity" (T35)

According to the primary school teachers, the reasons originating from the students are considered from the most to the least as absence of students in the lessons (f = 22), the low motivation in students (f = 17), students being indifferent (f = 11), students not reinforcing what they learned (f = 9), students watching the lesson in a passive way (f = 8), weakness of digital skills in students (f = 7), reluctance of students (f = 7), students not feeling responsible (f = 3), poor readiness of students (f = 2), perceiving the process as a holiday (f = 2), abstention of students (f = 1), prejudice in students (f = 1), and anxiety in students (f = 1). Some quotations from the opinions of primary school teachers regarding the category of reasons originating from students are given below.

"Students do not comply with the duration of the lesson. When they get bored, they leave the lesson… "(T17)

"Shy and indifferent students completely break away from the lesson ..." (T140)

"Students not actively participating in the lesson and watching the lesson from the screen ..." (T206)

According to the primary school teachers, the reasons originating from the technical problems are considered from the most to the least as connection (internet) problems (f = 30), lack of hardware (f = 17), the impossibility of acquiring technological tools (f = 12), problems in logging into online education platforms (f = 7), insufficiency of digital lesson materials (f = 1) and power cut (f = 1). Some quotations from the opinions of primary school teachers regarding the category of reasons originating from technical problems are given below.

"Because there is not enough technological equipment in the houses ..." (T175)

"Experiencing problems on the internet because of the living in a village ..." (T239)

"Problems in programs used in distance education ..." (T79)

According to the primary school teachers, the reasons originating from the technical problems are considered from the most to the least as parents not providing the necessary support (f = 17), the indifference of parents (f = 15), the lack of an appropriate learning environment at home (f = 12), presence of distracting stimuli in the home environment (f = 8), the intervention of family members during the lesson (f = 4), parents not cooperating with the teacher (f = 2), and family members doing the homework of students (f = 1). Some quotations from the opinions of primary school teachers regarding the category of reasons originating from a parents are given below.

"Existence of father, mother and other family members in a room and distraction of focus ..." (T47)

"... Not getting enough support from families…" (T20)

"... They cannot pay as much attention as in the classroom setting. Home environments are not suitable. " (T25)

According to the primary school teachers, the reasons originating from planning are considered from the most to the least as short lesson period (f = 24), learning outcomes being in a large number (f = 7), absence of compulsory school attendance (f = 3) and the implementation of the

current program (f = 2). Some quotations from the opinions of primary school teachers regarding the category of reasons originating from planning are given below.

"... Due to the short duration of lessons and learning outcomes being in a large number, learning cannot be achieved completely." (T225)

"Students leaving the course whenever they want and teachers not being able to note their absence..." (T8)

"Trying to implement the current program ..." (T181)

According to the primary school teachers, the reasons originating from the teacher are considered from the most to the least as poor digital skills of teachers (f = 2), strict behavior of teachers (f = 1), and prejudice of teachers (f = 1). Some quotations from the opinions of primary school teachers regarding the category of reasons originating from the teacher are given below.

"Lack of teachers' skill in providing lesson materials online ..." (T167)

"... Teachers' prejudice..." (T18)

"... Teachers displaying a strict and authoritarian attitude..." (T193)

According to the primary school teachers, the reasons originating from the insufficiency of support services are considered from the most to the least as not being informed (f = 1) an insufficiency of technical support (f = 1). Some quotations from the opinions of primary school teachers regarding the category of reasons originating from the insufficiency of support services are given below.

"... Teachers, students and especially parents not being informed about distance education..." (T17)

"... Insufficiency of infrastructure and technical support ..." (T12)

Findings regarding the suggestions for eliminating the students' learning deficiencies in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic.

The opinions expressed by primary school teachers regarding eliminating the students' learning deficiencies in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic were analyzed by content analysis. The findings obtained are given in Table 2.

Tablo 2. Suggestions of primary school teachers for eliminating the students' learning deficiencies in mathematics lessons in the distance education process

Categories	**Sub-categories**	**f**
Suggestions regarding planning	Transition to face to face education	65
	Performing remedial education	43
	Dilution of current mathematics lesson subjects and learning outcomes	22
	Extending the duration of lessons	11
	Taking steps to identify and eliminate the learning deficiencies	10
	Ensuring participation in the lesson	9
	Increasing the number of lessons	4
	Transition to hybrid education	4
	One-to-one distance education	4
	Forming groups in different levels	3
	Decreasing duration of lesson in lower grades	3
	Focusing on essential learning outcomes	2
	Making the lesson attendance compulsory	2
	Decreasing the number of students	2
	Strengthening parent-teacher-student relationship	1
Total		*185*

Tablo 2. Suggestions of primary school teachers for eliminating the students' learning deficiencies in mathematics lessons in the distance education process (Continued)

Categories	**Sub-categories**	**f**
Suggestions regarding the learning-teaching process	Using interesting materials	10
	Using concrete materials	9
	Performing continuous reinforcement	8
	Associating mathematics lesson with daily life	4
	Making the lesson funny	4
	Giving importance to applied studies	3
	Using materials suitable for different student levels	2
	Increasing the usage of visual materials	2
	Performing frequent controls	2
	Applying different techniques	2
	Endearing mathematics lesson	2
	Using materials suitable for different student styles	1
	Giving homework, ensuring their control and feedback	1
	Using math videos in the form of cartoons	1
	Giving place to different activities	1
	Students creating material at home	1
	Using new generation problems	1
	Establishing a link between mathematics and other subjects	1
	Behaving patiently	1
	Making use of different sources	1
Total		*57*
Suggestions regarding technical improvements	Improving students' connections	19
	Providing students with equipment	15
	Developing a digital material pool	7
	Supporting the families who do not have technological opportunities	4
	Enforcing the platforms and systems used	3
	Developing measurement and evaluation systems for digital environments	3
Total		*51*
Suggestions regarding parents	Parents' support	10
	Parents' attention	7
	Parents' cooperating with the teacher	5
	Parents' reducing negative stimuli in the learning environment	2
	Parents following up with their children	1
	Parents motivating their children	1
	Parents providing a suitable working environment for their children	1
	Parents not intervening during the lesson	1
Total		*28*
Suggestions regarding the development of students	Developing students' sense of responsibility	4
	Students reinforcing what they have learned	3
	Developing students' digital skills	2
	Increasing student motivation	2
	Making students believe that they can be successful	1
	Students comprehending the importance of mathematics	1
	Ensuring students pay their attention to the lesson	1
Total		*14*

Tablo 2. Suggestions of primary school teachers for eliminating the students' learning deficiencies in mathematics lessons in the distance education process (Continued)

Categories	Sub-categories	f
Suggestions regarding the support services	Informing parents about distance education	11
	Informing teachers about distance education	1
	Informing students about distance education	1
Total		13
Suggestions regarding the improvement of teachers' quality	Improving digital competencies of teachers	2
	Increasing willingness and motivation of teachers	1
Total		*3*

When Table 2 is examined, it is seen that the suggestions of primary school teachers to eliminate the students' learning deficiencies in mathematics lessons in the distance education process carried out due to the COVID-19 pandemic are gathered in seven categories as suggestions for planning, learning-teaching process, technical improvements, parents, student development, support services and improving the quality of teachers. The suggestions of primary school teachers for planning from the most to the least are transition to face to face education (f = 65), performing remedial education (f = 43), dilution of current mathematics lesson subjects and learning outcomes (f = 22), extending the duration of lessons (f = 11), taking steps to identify and eliminate the learning deficiencies (f = 10), ensuring participation in the lesson (f = 9), increasing the number of lessons (f = 4), transition to hybrid education (f = 4), one-to-one distance education (f = 4) , forming groups in different levels (f = 3), decreasing duration of lessons in lower grades (f = 3), focusing on basic learning outcomes (f = 2), making the lesson attendance compulsory (f = 2), decreasing the number of students (f = 2) and strengthening of parent-teacher-student relationship (f = 1). Some quotations from the opinions of primary school teachers regarding the category of suggestions for planning are given below.

"Students should be given remedial education for mathematics lesson ..." (T43)

"Mathematics lesson will be more effective if it is done face to face in the classroom environment" (T48)

"The main learning outcomes should be emphasized in the mathematics lesson; other learning outcomes should be made lighter ..." (Ö228)

The suggestions of the primary school teachers for the learning-teaching process from the most to the least are using interesting materials (f = 10), using concrete materials (f = 9), performing continuous reinforcement (f = 8), associating mathematics lesson with daily life (f = 4) , making the lesson funny (f = 4), giving importance to applied studies (f = 3), using materials suitable for different student levels (f = 2), increasing the usage of visual materials (f = 2), performing frequent controls (f = 2), applying different techniques (f = 2), endearing the mathematics lesson (f = 2), using materials suitable for different student styles (f = 1), giving homework, ensuring their control and feedback (f = 1), using math videos in the form of cartoons (f = 1), giving place to different activities (f = 1), students creating materials at home (f = 1), using new generation problems (f = 1), establishing link between mathematics and other lessons (f = 1) behaving patiently (f = 1) and making use of different resources (f = 1). Some quotations from the opinions of primary school teachers regarding the category of suggestions for the learning-teaching process are given below.

"... To endear the mathematics lesson and try to make it funny..." (T173)

"Enriching the curriculum and resources with new generation problems. Making the new generation problems suitable for digital use by videotaping them ..." (T4)

"More importance should be given to activities of practicing by writing ..." (T84)

The suggestions of primary school teachers for technical improvements from the most to the least are improving students' connections (f = 19), providing students with equipment (f = 15),

developing a digital material pool (f = 7), supporting the families who do not have technological opportunities (f = 4), enforcing the platforms and systems used (f = 3), developing measurement and evaluation systems for digital environments (f = 3). Some quotations from the opinions of primary school teachers regarding the category of suggestions for technical improvements are given below.

"Providing families with adequate equipment such as tablets and computers ..." (T9)

"… Strengthening and accelerating internet infrastructures…" (T234)

"… Strengthening the Zoom and EBA infrastructure…" (T62)

The suggestions of primary school teachers for parents from the most to the least are parents' support (f = 10), parents' attention (f = 7), parents cooperating with the teacher (f = 5), parents reducing negative stimuli in the learning environment (f = 2), parents following up their children (f = 1), parents motivating their children (f = 1), parents providing a suitable working environment for their children (f = 1), and parents not interfering during the lesson (f = 1). Some quotations from the opinions of primary school teachers regarding the category of suggestions for parents are given below.

"Parents should act in a way to increase the motivation of the students; they should make the student believe that they can be successful in the mathematics lesson." (T59)

"I can suggest that the parents should not intervene behind the screen during the lesson; they should see their shortcomings after the lesson and help them ..." (T35)

"During the lesson, negative stimuli should be reduced, and parents should act consciously." (T43)

The suggestions of the primary school teachers for the development of students from the most to the least are developing students' sense of responsibility (f = 4), students reinforcing what they have learned (f = 3), developing students' digital skills (f = 2), increasing student motivation (f = 2), making students believe that they can be successful (f = 1), students comprehending the importance of mathematics (f = 1) and ensuring students pay their attention to the lesson (f = 1). Some quotations from the opinions of primary school teachers regarding the category of suggestions for the development of students are given below.

"Students' sense of responsibility should be developed" (T67)

"Students' digital skills should be developed" (T96)

"Students should be made to believe that they can be successful in mathematics lesson" (T139)

The suggestions of the primary school teachers for the support services from the most to the least are informing parents about distance education (f = 11), informing teachers about distance education (f = 1), and informing students about distance education (f = 1). Some quotations from the opinions of primary school teachers regarding the category of suggestions for support services are given below.

"… Organizing parent informing activities…" (T14)

"Teachers and students should be informed about distance education ..." (T67)

The suggestions of the primary school teachers for the improvement of teachers' quality from the most to the least are improving teachers' digital competencies (f = 2) and increasing the willingness and motivation of teachers (f = 1). Some quotations from the opinions of primary school teachers regarding the category of suggestions for improving the quality of teachers are given below.

" Digital competencies of teachers should be improved" (T159)

"The willingness and motivation of teachers should be increased" (T203)

Discussion, Conclusion and Suggestions

In this study, the opinions of primary school teachers regarding the reasons for the students' learning deficiencies in mathematics lessons and the suggestions to eliminate these deficiencies in the distance education process carried out due to the COVID-19 pandemic were discussed. According to

the findings obtained, it has been determined that in the distance education process carried out due to the COVID-19 pandemic, and primary school teachers attribute the learning deficiencies of students in mathematics lesson from the most to the least to the reasons originating from the nature of distance education, students, technical problems, family, planning, teachers and inadequate support services. As the reasons originating from the nature of distance education, teachers displayed mostly insufficiency of interaction and communication and also some other reasons with regards to having difficulty in measuring and evaluating, feedback-correction, concentrating on the lesson, practicing, taking care of students one by one, taking different student levels and styles into account, writing mathematical expressions in the digital environment and the negativities brought about by the usage of digital tools. It is seen that these asserted reasons came forward as the disadvantages of mathematics learning-teaching processes in distance education carried out in the COVID-19 pandemic period also in other studies conducted (Almarashdi & Jarrah, 2021; Erduran & İnce Muslu, 2020; Irfan et al., 2020; Kilit & Güner, 2021; Mailizar, Almanthari, Maulina, & Bruce, 2020; Wahyuningrum & Latifah, 2020). The National Council of Teachers of Mathematics states that students who have the opportunities, encouragement, and support to speak, write, read and listen in mathematics lessons will communicate to learn mathematics and learn to communicate mathematically (NCTM, 2000). In the mathematics curriculum, it is stated that concrete materials should be used as much as possible in the teaching of new concepts and in the evaluations to be made (MEB, 2018). It can be said that there may be many limitations in distance education compared to face-to-face education due to the difference in physical space and usage of digital tools, and especially because primary school students are in the concrete operations period, digital environments may be insufficient in embodying abstract mathematics and interpreting mathematics.

As the reasons originating from the students, teachers brought forward the reasons such as students not participating in the lesson, low motivation, being indifferent, not reinforcing what has been learned, watching passively, weakness of digital skills, unwillingness, not feeling responsible, poor readiness, perceiving the process as a vacation, abstention, prejudice, anxiety. They put forward the reasons. It attracts the attention that these reasons came forth as the disadvantages of the COVID-19 pandemic period mathematics learning-teaching processes in other studies conducted (Erduran & İnce Muslu, 2020; Kilit & Güner, 2021; Mailizar et al., 2020). It can be said that mathematics lessons cannot be continued effectively due to the students not attending the lessons or not attending the lessons preparedly for various reasons, and the inadequacies in affective, physical, and psychomotor dimensions.

As the reasons for technical problems, teachers reported connection (internet) problems, lack of hardware, the impossibility of acquiring technological tools, logging into online education platforms, insufficiency of digital lesson materials, and power cut. These reasons appear to be a limitation in mathematics lessons conducted in digital environments and other studies (Erduran & İnce Muslu, 2020; Mailizar et al., 2020). Considering that distance education is sustained with technology, it can be said that these elements are essential not only for mathematics lessons but also for all other lessons. These factors may cause students not to be actively present in digital learning environments and may interrupt learning-teaching processes or reduce effectiveness.

As the reasons regarding parents, teachers listed the reasons such as parents not providing the necessary support and attention, failure to provide an appropriate learning environment at home, the presence of distracting stimuli in the home environment, the intervention of family members during the lesson, parents not cooperating with the teacher, the family members doing the homework of students. Also, in the researches conducted (Harper, Rosenberg, Comperry, Howell, & Womble, 2021; Panaoura, 2020), the family and home dimension in students' mathematics education during the COVID-19 outbreak has been an important issue. While schools are used as the environment in face-to-face education, the student's environment is the house in distance education. Hence, it can be said that the inability to provide learning environments at home and the parents not being able to provide the necessary moral and material support will reduce the effectiveness of mathematics learning processes.

As the reasons originating from planning, teachers stated the reasons such as short lesson period, learning outcomes being in a large number, absence of compulsory school attendance, and

implementing the current program. It is seen that some of the asserted reasons are emphasized in the research (Erduran & İnce Muslu, 2020). It can be said that students cannot fully achieve the targeted learning outcomes, as the learning outcomes cannot be achieved in the given lesson periods due to the implementation of the current program also in distance education, which was initiated urgently in the COVID-19 pandemic period.

As the reasons originating from teachers, the weakness of digital skills, strict attitudes of teachers, prejudge and as the reasons regarding the insufficiency of support services, not being informed and inadequacy of support services were shown. Some of these reasons were also included in some studies conducted at home and abroad (Erduran & İnce Muslu, 2020; Mailizar et al., 2020) as problems encountered in distance education mathematics lessons COVID-19 outbreak. It can be said that the learning-teaching processes are not efficient due to the fact that teachers, who are among the building blocks of education, do not have the relevant competencies and qualifications, partners are not informed about distance education and the necessary support on these issues cannot be received.

According to the findings obtained, it was determined that primary school teachers made suggestions for planning, learning-teaching process, technical improvements, parents, development of students, support services, and improving the quality of teachers in order to eliminate students' learning deficiencies in mathematics lesson in the distance education process carried out due to COVID-19 pandemic. Teachers made suggestions for planning mostly as transition to face to face education and some other suggestions such as performing remedial education, diluting the current mathematics lesson subjects and learning outcomes, extending the duration of lessons, transition to hybrid education, determining the learning deficiencies, and eliminating these deficiencies. Studies (Tezer, Cavus, Orkun, Osum, & Ture, 2021) have shown that even countries that conduct the pandemic process with hybrid education experience problems about the efficiency of mathematics lessons. It can be said that because teachers complain that distance education cannot provide the opportunities provided by face-to-face education, suggestions for switching to face-to-face education outweigh. In addition, it can be said that with the integration of the current curriculum into distance education, the learning outcomes are in a large number considering specified periods, and the teachers suggest that the arrangements on these issues should be made again because the time is short for the determined learning outcomes. Also, according to Aydemir (2018), the entire structure in distance education systems should be built in line with student needs and the program should be built on student outcomes. Therefore, arrangements can be made by considering the needs in order for mathematics education to achieve its purpose.

Teachers also made suggestions such as using interesting and concrete materials, performing continuous reinforcement, associating the mathematics lesson with daily life, making the lesson funny, giving importance to applied studies for the learning-teaching process; improving students' connections, providing students with equipment, developing a digital material pool for technical improvements; developing students' sense of responsibility and their digital skills, making students believe that they can be successful, increasing students' motivation for the development of students; informing parents, teachers, and students about distance education for support services, and developing digital competencies and increasing willingness and motivation for their colleagues. It is seen that some of these suggestions were specified by researchers or participants in various studies (Erduran & İnce Muslu, 2020; Kamsurya, 2020; Kilit & Güner, 2021; Kuzu, 2020; Marbán et al., 2021; Marpa, 2021; Mulenga & Marbán, 2020; Panaoura, 2020) in order for the problems experienced in distance education activities in mathematics lesson during the COVID-19 pandemic period to be eliminated or ameliorated. It is seen that teachers offer various suggestions to partners, mostly in order to enrich the learning-teaching process, to emancipate it from uniformity, and making it more efficient. It can be said that all partners who have a direct or indirect influence on this process, especially teachers on one side of the communication channel and students on the other side, should give importance to distance education, take responsibility, and make an effort.

When the findings obtained from the research are evaluated in general, it was determined that teachers consider the structure of distance education, especially the lack of interaction and communication, as the most important reason for the mathematics lesson learning deficiency in students in the distance education process carried out due to COVID-19 pandemic; and as for the

elimination of learning deficiencies, they suggested to switch to face-to-face education at most. In the study, it has been observed that classroom teachers draw attention to many factors regarding the cause of the learning deficiency and its elimination. These reasons or suggestions can also be encountered in distance education activities in different student levels and disciplines during the COVID-19 pandemic period. It can be said that since this research is aimed at the mathematics lesson, which has a unique abstract structure and aimed at the elementary school, which is among lower levels, the emerging elements should be overemphasized. Because while numerical data are frequently encountered in daily life or professional fields, living conditions require having skills related to technology and mathematics. Students also discover important ideas (Van de Walle, Karp, Bay-Williams, Wray, & Brown, 2019). This study is limited to the opinions of teachers who believe that students have learning deficiencies. The research is thought to contribute to the studies to be carried out to eliminate learning deficiencies or prevent their occurrence during or after the COVID-19 pandemic.

The following suggestions have been recommended in line with the findings obtained from the research;

- Students' learning deficiencies in mathematics lessons in the distance education process can be determined, and remedial education can be given on these subjects.
- If the distance education continues, the current program can be revised by this process.
- In order to make the distance education process more efficient, all partners can be informed about distance education, and studies can be carried out to increase the partners' digital competencies.
- Studies may be conducted to improve digital tools used in distance education.

References

Almarashdi, H., & Jarrah, A. M. (2021). Mathematics distance learning amid the COVID-19 pandemic in the uae: high school students' perspectives. *International Journal of Learning, Teaching and Educational Research, 20* (1), 292-307. doi: 10.26803/ijlter.20.1.16

Altıntaş Yüksel, E. (2021). Sınıf Öğretmenlerinin Covid-19 Salgını Sürecinde Çevrim İçi Ders-Uzaktan Eğitim Deneyimlerinin İncelenmesi. *Ulakbilge*, *9*(57), 291–303. doi: 10.7816/ulakbilge-09-57-11

Ayaz, E. (2021). İlkokul fen bilimleri dersinin pandemi dönemi uzaktan eğitimine ilişkin öğretmen ve ebeveyn görüşlerinin incelenmesi. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi*, *34*(1), 298-342. doi: 10.19171/uefad.815664

Aydemir, M. (2018). *Uzaktan eğitim program, ders ve materyal tasarımı*. Ankara: Eğitim Yayınevi

Baran, A., & Sadık, O. (2021a). Covid-19 sürecinde sınıf öğretmenlerinin acil uzaktan öğretim tecrübelerinin ve görüşlerinin incelenmesi. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi*, *34*(2), 813-854. doi: 10.19171/uefad.882291

Baran, A., & Sadık, O. (2021b). Sınıf öğretmenlerinin acil uzaktan eğitim sürecindeki hazırbulunuşlukları ve görüşleri. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*. (38), 1-33.

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

Brako, K., & Essel, H. B. (2020). Assessment of COVID-19 on primary education in Ghana. *Journal of Internet Banking and Commerce*, *25*(5), 1-10.

Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration, *Distance Education*, *27*(2), 139-153. doi: 10.1080/01587910600789498

Bergdahl, N., & Nouri, j. (2020). Covid- 19 and crisis- prompted distance education in Sweden. *Technology, Knowledge and Learning*. doi: 10.1007/s10758-020-09470-6.

Bulut, S., & Susar Kırmızı, F. (2021). Covid-19 salgını sürecinde uzaktan eğitimde Türkçe dersine ilişkin sınıf öğretmenlerinin görüşleri. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi (AUAd)*, 7(4), 1-30. doi: 10.51948/auad.960960

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2016). *Bilimsel araştırma yöntemleri* (20th ed.). Ankara: Pegem Akademi.

Cassibba, R., Ferrarello, D., Mammana, M.F., Musso, P., Pennisi, M., & Taranto, E. (2021). Teaching Mathematics at Distance: A Challenge for Universities. *Educ. Sci. 11* (1), 1-20. doi: 10.3390/educsci1%201010001

Cohen, L., Manion, L., & Morrison, K. (2007) *Research methods in education* (6th ed.). New York: Routledge.

Das, K. (2021). İntegrating e-learning & technology in mathematics education. *Journal of Information and Computational Science*, *11*(1), 310-319. doi: 10.12733.JICS.2021.V11I1.535569.19634

Demir, F., & Özdaş, F. (2020). COVID-19 sürecindeki uzaktan eğitime ilişkin öğretmen görüşlerinin incelenmesi. *Millî Eğitim*, *49*(1), 273-292. doi: 10.37669/milliegitim.775620

Diana, N., Suhendra, S., Yohannes, Y., & Sukma, Y. (2021). Primary Students' Perceptions toward the Effectiveness of Online Learning during the COVID-19 Pandemic. *Journal of Hunan University Natural Sciences*, *48*(10), 577-584. Retrieved from http://jonuns.com/index.php/journal/article/view/822

Düzgün, S., & Sulak, S. E. (2020). Öğretmen adaylarının COVID-19 pandemisi sürecinde uzaktan eğitim uygulamalarına ilişkin görüşleri. *Millî Eğitim*, *49*(1), 619-633.

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.

Erduran, A., & İnce Muslu, B. (2020). Covid-19 sürecinde lise matematik öğretmen ve öğrencilerinin web tabanlı uzaktan eğitim uygulamaları hakkındaki görüşleri. In F. Nayır (Ed.), *VIIth International Eurasian Educational Research Congress* (pp. 141-153). Eskişehir: Anadolu Üniversitesi.

Erol, M., & Erol, M. (2020). Koronavirüs pandemisi sürecinde ebeveynleri gözünden ilkokul öğrencileri. *Millî Eğitim*, *49*(1), 529-551. doi: 10.37669/milliegitim.766194

Er Türküresin, H. (2020). COVID-19 pandemi döneminde yürütülen uzaktan eğitim uygulamalarının öğretmen adaylarının görüşleri bağlamında incelenmesi. *Millî Eğitim, 49*(1), 597-618.

Fidan, M. (2020). COVİD-19 belirsizliğinde eğitim: İlkokulda zorunlu uzaktan eğitime ilişkin öğretmen görüşleri. *Uşak Üniversitesi Eğitim Araştırmaları Dergisi*, *6*(2), 24-43.

Gezen. M. O., & Efendioğlu, A. (2021). Sınıf öğretmenlerinin Eğitim Bilişim Ağı Televizyon Kanalı (EBA TV) üzerinden yapılan uzaktan eğitime ilişkin görüşlerinin incelenmesi. *Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *7*(3), 776-791.

Gibbs, G. R. (2007). *Analyzing qualitative data*. London: Sage Publications.

Günbaş, N., & Gözüküçük, M. (2020). Covid-19 pandemi sürecinde yürütülen uzaktan eğitimle ilgili ilkokul öğrenci velilerinin görüşleri. *Sakarya University Journal of Education, 10*(3), 686-716. doi: 10.19126/suje.789705

Harper, F. K., Rosenberg, J. M., Comperry, S., Howell, K., & Womble, S. (2021). # mathathome during the COVID-19 pandemic: Exploring and reimagining resources and social supports for parents. *Education Sciences*, *11*(2), 1-24. doi: 10.3390/educsci11020060

Irfan, M., Kusumaningrum, B., Yulia, Y., & Widodo, S. A. (2020). Challenges during the pandemic: Use of e-learning in mathematics learning in higher education. *infinity journal*, *9*(2), 147-158. doi: 10.22460/infinity.v9i2.p147-158

İnci Kuzu, Ç. (2020). COVID-19 pandemisi sürecinde uygulanan ilkokul uzaktan eğitim programı (eba tv) ile ilgili veli görüşleri. *Milli Eğitim*, *49*(1), 505-527. doi: 10.37669/milliegitim.720556

Jamilah, J., Sukitman, T., & Fauzi, M. (2021). Opportunities and challenges of digital learning media during the covid-19 pandemic in primary school. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *11* (2): 191-200. Retrieved from https://journal.lppmunindra.ac.id/index.php/Formatif/article/view/9732

Gupta, P., & Gupta, P. (2020). E-learning in COVID-19 lockdown (a case study of primary school students in moradabad city). *International Journal in Management and Social Science*, *8*(5), 12-18.

Kamsurya, R. (2020). Learning evaluation of mathematics during the pandemic period COVID-19 in Jakarta. *International Journal of Pedagogical Development and Lifelong Learning*, *1*(2), 1-5. doi: 10.30935/ijpdll/8439

Karabudak, M. G. (2020). Opinions of 1st grade teachers on distance education adaptation process during the Covid 19 pandemic period. *Social Scientific Centered Issues*, *2*(2), 72-80.

Karaca, İ., Karaca, N., Karamustafaoğlu, N., & Özcan, M. (2021). Öğretmenlerin uzaktan eğitimin yararına ilişkin algılarının incelenmesi. *Humanistic Perspective*, *3* (1), 209-224. doi: 10.47793/hp.844113

Karasar, N. (2019). *Bilimsel araştırma yöntemi: Kavramlar, ilkeler, teknikler*. Ankara: Nobel Akademik Yayıncılık.

Kargın, T., & Karataş, A. (2021). Sınıf öğretmenlerinin gözünden küresel salgın sürecinde uzaktan eğitim aracılığıyla ilk okuma yazma öğretimi. *Ana Dili Eğitimi Dergisi*, *9*(4), 1264-1284.

Kaya, Z. (2002). *Uzaktan eğitim*. Ankara: Pegem A Yayıncılık.

Kesik, C., & Baş, Ö. (2021). Sınıf öğretmenlerinin perspektifinden eba ve eğitim portalları ile ilk okuma ve yazma öğretimi. *EĞİTİM TEKNOLOJİSİ Kuram ve Uygulama*, *11*(1), 93-115.

Kızıltaş, Y., & Çetinkaya Özdemir, E. (2021). Sınıf öğretmenlerinin uzaktan eğitim sürecine yönelik görüşleri. *Elektronik Sosyal Bilimler Dergisi*, *20*(80), 1896-1914.

Kilit, B., & Güner, P. (2021). Matematik derslerinde web tabanlı uzaktan eğitime ilişkin matematik öğretmenlerinin görüşleri. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, *9*(1), 85–102. doi: 10.18506/anemon.803167

Koi-Akrofi, G. Y., Owusu-Oware, E., & Tanye, H. (2020). Challenges of distance, blended, and online learning: A literature-based approach. *International Journal on Integrating Technology in Education (IJITE)*, *9*(4), 27-39.

Korucuk, B. (2020). Sınıf öğretmenleri gözüyle uzaktan eğitim memnuniyet faktörlerinin derecelendirilmesi yönelik bir çalışma: giresun ili örneği. *Instructional Technology and Lifelong Learning*, *1*(2), 189-202.

Koç, E.S. (2021). İlkokul öğretim programlarının COVID-19 sonrası yaygınlaşan uzaktan eğitime uygunluğunun incelenmesi. *International Anatolia Academic Online Journal / Sosyal Bilimler Dergisi*, *7*(1), 24-36.

Konca, A. S., & Çakır, T. (2021). Pandemi sürecinde uzaktan eğitim ile okul öncesi eğitimden ilkokula geçiş hakkında veli görüşleri. *Yaşadıkça Eğitim*, *35*(2), 520-545. doi: 10.33308/26674874.2021352307

Köse, S. (2007). *İlköğretim altıncı sınıf matematik dersi ölçüler ünitesinde öğrenme eksiklikleri tamamlanarak yapılan öğretimin öğrenci başarısına etkisi* (Unpublished master's thesis). Selçuk Üniversitesi, Konya.

Kurt, K., Kandemir, M. A., & Çelik, Y. (2021). Covid-19 pandemi sürecinde uzaktan eğitime ilişkin sınıf öğretmenlerinin görüşleri. *TÜBAD*, *6*(1), 88-103.

Kuzu, O. (2020). Pandemi dönemi uzaktan eğitim sürecinin matematik öğretmeni adaylarının sınav performanslarının değerlendirilmesine yansıması. *Birey ve Toplum Sosyal Bilimler Dergisi*, *10* (2), 239-271.

Mailizar,M., Almanthari, A., Maulina, S., & Bruce, S. (2020). Secondary school mathematics teachers' views on e-learning implementation barriers during the COVID-19 pandemic: The case of Indonesia. *Eurasia Journal of Mathematics, Science and Technology Education*, *16*(7), 1-9. doi:10.29333/ejmste/8240

Marbán, J. M., Radwan, E., Radwan, A., & Radwan, W. (2021). Primary and secondary students' usage of digital platforms for mathematics learning during the COVID-19 outbreak: The case of the Gaza Strip. *Mathematics*, *9*(2), 1-21. doi: 10.3390/math9020110

Marpa, E. P. (2021). Technology in the teaching of mathematics: An analysis of teachers' attitudes during the COVID-19 pandemic. *International Journal on Studies in Education (IJonSE)*, *3*(2), 92-102.

Merriam, S.B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th. ed.). San Francisco, CA: Jossey-Bass Publishers.

Mertens, D. M. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (3th ed.). Thousand Oaks, CA: SAGE Publications.

Meeter, M. (2021, Ocak 18). Primary school mathematics during Covid-19: No evidence of learning gaps in adaptive practicing results. doi: 10.31234/osf.io/8un6x

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A sourcebook of new methods* (3. Baskı). Thousand Oaks, CA: Sage Publications.

Millî Eğitim Bakanlığı (2018). *Matematik Dersi Öğretim Programı (İlkokul ve Ortaokul 1, 2, 3, 4, 5, 6, 7 ve 8. Sınıflar)*. Retrieved from http://mufredat.meb.gov.tr/Dosyalar/201813017165445-MATEMAT%C4%B0K%20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI%202018v.pdf

Millî Eğitim Bakanlığı (2019, Aralık). *PISA 2018 Türkiye Ön Raporu*. Retrieved from http://pisa.meb.gov.tr/wpcontent/uploads/2020/01/PISA_2018_Turkiye_On_Raporu.pdf

Millî Eğitim Bakanlığı (2020a, Mart 12). *Bakan selçuk, koronavirüs'e karşı eğitim alanında alınan tedbirleri açıkladı*. Retrieved from http://www.meb.gov.tr/bakan-selcuk-koronaviruse-karsi-egitim-alaninda-alinan-tedbirleri-acikladi/haber/20497/tr

Millî Eğitim Bakanlığı (2020b, Aralık) TIMSS 2019 Türkiye Ön Raporu. Retrieved from https://odsgm.meb.gov.tr/meb_iys_dosyalar/2020_12/10175514_TIMSS_2019_Turkiye_On_Raporu_.pdf

Millî Eğitim Bakanlığı (2020c, Temmuz). *2020 Ortaöğretim Kurumlarına İlişkin Merkezi Sınav.* Retrieved from http://www.meb.gov.tr/meb_iys_dosyalar/2020_07/17104126_2020_Ortaogretim_Kurumlarina_Iliskin_Merkezi_Sinav.pdf

Mulenga, E. M., & Marbán, J. M. (2020). Is COVID-19 the-gateway-for-digital-learning-in-mathematics-education. *Contemporary Educational Technology*, *12*(2), 1-11. doi:10.30935/cedtech/7949

National Council of the Teachers of Mathematics (2000). *Principles standards and for school mathematics*. Reston: The National Council of Teachers of Mathematics, Inc.

Nazarova, S. K., Jalilova, G. A., Mukhamedova, N. S., & Rasulova, N. F. (2021). Features of distance learning organization. *Annals of the Romanian Society for Cell Biology*, *25* (1), 339 - 347.

Okatan, Ö. & Tagay, Ö. (2021). İlkokul velilerinin görüşlerine göre COVID-19 pandemisi. *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, *17*(2), 309-328.

Olkun, S., & Toluk Uçar, Z. (2014). *İlköğretimde etkinlik temelli matematik öğretimi* (6th ed.). Ankara: Eğiten Kitap.

Örs, E. (2019). A case study on reading-writing learning of a fourth grade student at primary school. *HAYEF: Journal of Education*, *16*(1), 68-88.

Özcan, A. F., & Saydam, E. N. (2021). İlkokul birinci sınıf öğretmenlerinin Covid 19 salgın sürecinde ilk okuma yazma öğretimine yönelik algıları. *Journal of Individual Differences in Education*, *3*(2), 62-86.

Özden, G. & İlgar, Ş. (2021). COVID-19 sürecinde ilkokul 1. sınıfa başlayan öğrencilerin annelerinin kaygı durumlarının çeşitli değişkenler açısından incelenmesi. *International Primary Educational Research Journal*, *5*(3), 225-242.

Panaoura, R. (2020). Parental involvement in children's mathematics learning before and during the period of the COVID-19. *Social Education Research*, *2*(1), 65-74.

Paudel, P. (2021). Online education: Benefits, challenges and strategies during and after covıd-19 in higher education. *International Journal on Studies in Education (IJonSE)*, 3(2), 70-85.

Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4. Baskı). Thousand Oaks, CA: Sage Publications.

Pozas, M., Letzel, V., & Schneider, C. (2021). Homeschooling in times of corona': exploring Mexican and German primary school students' and parents' chances and challenges during homeschooling. *European Journal of Special Needs Education*, *36*(1), 35-50. doi: 10.1080/08856257.2021.1874152

Putri, R. S., Purwanto, A., Pramono, R., Asbari, M., Wijayanti, L. M., & Hyun, C. C. (2020). Impact of the COVID-19 pandemic on online home learning: An explorative study of primary schools in Indonesia. *International Journal of Advanced Science and Technology*, *29*(5), 4809-4818. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/13867/7119

Rahmaini, R. (2021). Analysis of whatsapp groups usage in primary schools during the Covid-19 pandemic. *Al-Ishlah: Jurnal Pendidikan*, *13*(3), 1715-1722. Retrieved from https://www.journal.staihubbulwathan.id/index.php/alishlah/article/viewFile/760/465

Rasmitadila, R., & diğerleri (2020). The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia. *Journal of Ethnic and Cultural Studies*, *7*(2), 90-109. doi: 10.29333/ejecs/388

Rumble, G. (1989). Concept: On defining distance education. *American Journal of Distance Education, 3*(2), 8–21. doi:10.1080/08923648909526660

Sakallı, Ö., Altınay, F., Altınay, M., & Dağlı, G. (2021) How primary school children perceive tolerance by technology supported ınstruction in digital transformation during Covid 19. *Front. Psychol. (12)*752243. doi: 10.3389/fpsyg.2021.752243

Sarı, T., & Nayır, F. (2020). Pandemi dönemi eğitim: Sorunlar ve fırsatlar. *Turkish Studies*, *15*(4), 959-975. doi: 10.7827/TurkishStudies.44335

Sarışık, S., Uslu, E., Sarışık, S., & Uslu, Ş. (2021). Covid-19 salgın sürecinde ilkokullarda uygulanan uzaktan eğitim sürecine ilişkin öğretmen görüşlerinin incelenmesi. *Kesit Akademi Dergisi*, *7* (28), 491-506.

Saygı, H. (2021). Covid-19 pandemi uzaktan eğitim sürecinde sınıf öğretmenlerinin karşılaştığı sorunlar. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi (AUAd)*, *7*(2), 109-129. doi: 10.51948/auad.841632

Sirem, Ö., & Baş, Ö. (2020). Okuma güçlüğü olan ilkokul öğrencilerinin Covid-19 sürecinde uzaktan eğitim deneyimleri. *Turkish Studies*, *15*(4), 993-1009. doi.org/10.7827/TurkishStudies.43346

Tesfamicael, S. A., & Ayalew, Y. (2021). Mathematics education in Ethiopia in the Era of COVID-19: Boosting equitable access for all learners via opportunity to learning. *Contemporary Mathematics and Science Education*, *2*(1), 1-9. doi: 10.30935/conmaths/9680

Tezer, M., & Cumhur, M. G. (2020). Salgın hastalık sürecinde çevrimiçi matematik dersine yönelik öğrenci görüşleri. In Z. Altınay, Y. Çerkez ve U. Akçıl (Eds.), *2st International Conference on Interdisciplinary Educational Reflections* (pp. 88-92). Lefkoşa: Yakın Doğu Üniversitesi.

Tezer, M., Cavus, S., Orkun, M. A., Osum, A., & Ture, A. (2021). Examination of opinions of elementary school students on mathematics course in the covid-19 pandemic process. *International Journal of Learning and Teaching*. *13*(1), 42– 53. doi.org/10.18844/ijlt.v13i1.5279

Tremblay, M., & Delobbe, A.M. (2021). Distance Learning and Assessment of Mathematics During COVID-19. *Canadian Journal of Learning and Technology*, *47*(4), 1-23. Retrieved from https://cjlt.ca/index.php/cjlt/article/view/28098 adresinden elde edilmiştir.

Uğur Göçmez, A., & Ünal, E. (2021). Dijital eğitim sürecinde ilk okuma yazma öğretiminde karşılaşılan sorunların öğretmen görüşleri doğrultusunda incelenmesi. *Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *7*(3), 936-955.

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

Usta, M. E., & Dönmez, F. (2021). İlkokullarda görev yapan öğretmenlerin Covid19 sürecinde yürütülen eğitim faaliyetlerine ilişkin görüşleri. *The Journal of International Lingual Social and Educational Sciences*, *7*(1), 32-46.

Uysal, F., & Kısa, N. (2021). Covid-19 pandemi döneminde ilkokul web sayfalarının program dışı etkinlikler bağlamında incelenmesi: Burdur İli örneği. *Kocaeli Üniversitesi Eğitim Dergisi*, *4*(2), 398-415. doi: 10.33400/kuje.913535

Van de Walle, J. A., Karp, K. S., Bay-Williams, J. M., Wray, J., & Brown, E. T. (2019). *Elementary and middle school mathematics: Teaching developmentally* (10th ed.). New York: Pearson.

Wahyuningrum, A. S., & Latifah, T. (2020). Investigating mathematical conversation in remote learning of mathematics during the covid-19 pandemic. *Jurnal Riset Pendidikan Matematika*, *7*(2) 148–162.

WHO (2020, Mart 11). *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. Retrieved from https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

Wijaya, T. T. (2021). How Chinese students learn mathematics during the Coronavirus pandemic. *International Journal of Educational Research and Innovation (IJERI)*, *15*, 1-16. doi: 10.46661/ijeri.4950

Xie, Z., Xiao, L., Hou, M., Liu, X., & Liu, J. (2021). Micro classes as a primary school-level mathematics education response to COVID-19 pandemic in China: Students' approval degree and perceived equity. *Educational Studies in Mathematics*. doi: 10.1007/s10649-021-10111-7

Yadigar, B., & Yadigar, G. C. (2021). İlkokullarda uzaktan eğitime yönelik paydaş görüşleri. *Çankırı Karatekin Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *12*(2), 526-566. doi: 10.54558/jiss.943013

Yıldırım, A., & Şimşek, H. (2018). *Sosyal bilimlerde nitel araştırma yöntemleri* (11th ed.). Ankara: Seçkin Yayıncılık.

Yurtbakan, E., & Akyıldız, S. (2020). Sınıf öğretmenleri, ilkokul öğrencileri ve ebeveynlerin Covid-19 izolasyon döneminde uygulanan uzaktan eğitim faaliyetleri hakkındaki görüşleri. *Turkish Studies*, *15*(6), 949-977. doi: 10.7827/TurkishStudies.43780