Emergency Online Teaching and COVID-19:
Teachers' Use and Integration of Computer Technologies[*]

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Abstract

The aim of the research was to determine the use of computer technologies and the status of integration into lessons during online teaching by class teachers during the COVID-19 pandemic. The research used a descriptive survey model. The study group for the research comprised 464 class teachers employed in official primary schools linked to the Ministry of National Education in Rize province. Two scales were used in the research; the Technology Integration Self-Efficacy Scale and the Teachers' Information and Communication Technologies Integration Approach Scale. Data were analyzed with the t test, ANOVA and correlation test. Male teachers were determined to have higher use of computer technologies and higher levels of ability to integrate it into lessons compared to female teachers. Though there was no difference in use of technology levels of teachers, their levels of ability to integrate technology into lessons differed according to seniority. The use of computer technology by teachers and levels of ability to integrate into lessons did not differ according to receiving in-service training related to technology and educational status. Teachers' use of technology and levels of ability to integrate into lessons differed according to the hours of lessons given using technology. As the levels of use of education technology by class teachers increased, their levels of ability to integrate computer technology into lessons also increased.

Keywords: Online teaching, technology integration, class teacher, Covid 19.

Acil Çevrimiçi Öğretim ve COVID-19: Öğretmenlerin Bilgisayar Teknolojilerini Kullanımı ve Entegrasyonu[*]

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Öz

Bu araştırmanın amacı Covid 19 sürecinde görev yapan sınıf öğretmenlerinin çevrimiçi öğretimde bilişim teknolojilerini kullanım ve derslerine entegrasyonlarının ne durumda olduğunu belirlemektir. Araştırmada betimsel tarama modeli kullanılmıştır. Araştırmanın çalışma grubunu Rize ilindeki Millî Eğitim Bakanlığına bağlı resmi ilkokullarda çalışan 464 sınıf öğretmeni oluşturmaktadır. Araştırmada Öğretmenlerin Teknoloji Entegrasyonuna Yönelik Öz-Yeterlik Algıları ve Öğretmenlerin BİT Entegrasyon Yaklaşımları ölçeği kullanılmıştır. Veriler t testi, Anova ve Korelasyon testi analizleri kullanılarak analiz edilmiştir. Erkek öğretmenlerin, kadın öğretmenlere göre bilişim teknolojilerini kullanım ve derslerine entegre edebilme düzeylerinin daha yüksek olduğu belirlenmiştir. Öğretmenlerin teknolojiyi kullanım düzeyleri kıdeme göre farklılaşmamasına karşın teknolojiyi derslerine entegre edebilme düzeyleri farklılaşmaktadır. Öğretmenlerin bilişim teknolojilerini kullanma ve derslerine entegre edebilme düzeyleri, teknolojiyle ilgili hizmet içi eğitim alma ve öğrenim durumuna göre farklılaşmamaktadır. Öğretmenlerin teknolojiyi kullanma ve derslerine entegre edebilme düzeyleri, teknoloji kullanarak ders anlatma saatine göre farklılaşmaktadır. Sınıf öğretmenlerinin eğitim teknolojileri kullanım düzeyleri arttıkça BİT derslerine entegre edebilme düzeyleri de artmaktadır.

Anahtar Sözcükler: Online eğitim, teknoloji entegrasyonu, sınıf öğretmeni, Covid 19.

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Introduction

The need for class teachers to be versatile and equipped to use technology in education to cultivate children who will be able to cope with changing problems in the 21st century was revealed in all dimensions by the experience of mandatory distance education during the COVID-19 pandemic. This unexpected process caught all stakeholders including the Ministry of National Education (MoNE), education managers, school administrators, teachers, parents and students unprepared. Firstly, it was observed that teachers, with key placement in the compulsory distance education process, did not have the infrastructure to manage this process in a short duration.

Due to the COVID-19 pandemic, education stopped in 195 countries, including Türkiye (Eğitim Reformu Girişimi (ERG), 2020). Due to the pandemic, primary schools, middle schools, high schools, and higher education institutions in Türkiye stopped face-to-face education for two weeks from 16-30 March. While other countries around the world made the decision to continue with distance education, equivalent to these developments, in Türkiye MoNE decided to continue education for primary schools, middle schools and high schools with the national distance education platform called Education Computer Network (ECN) and through television channels run by Türkiye Radio Television (TRT). This was implemented on 23 March 2020). Through ECN on TRT, 10 different lessons for primary and middle school levels and 22 different lessons for high school level were completed with TV support (Can, 2020; MoNE, 2020a). The distance education process ended on 19 June 2020 (Eğitim-Sen, 2020; TEDMEM, 2020). A summer school program was completed from 27 June-28 August 2020. It was announced that the 2020-2021 academic year would end on June 18, 2021, and that summer programs and after-school programs would be offered to compensate for the learning loss that took place as a result of COVID-19. However, attending these additional learning opportunities would be optional, not mandatory. It was announced that schools would open on 31 August 2020. However, in practice schools opened with online education on 21 September 2020 in stages and in accordance with social distancing rules. From 2 November, the transition to face-to-face education began in stages. The mid-term break was from 16-20 November and then MoNE announced that online education would continue from 20 November to 4 January 2021 (MoNE, 2020a). Finally, the first semester of the 2020-2021 educational year was extended to 22 January 2021 (MoNE, 2020b). As can be seen from the announcements, education for students could not be completed face-to-face but was performed with distance education using ECN due to the pandemic.

Linked to the COVID-19 pandemic, 18 million students in Türkiye and 1.5 billion students around the world were caught unprepared and had to continue their education at home; hence, studies about problems experienced within a short duration locally in Türkiye and around the world were performed. These studies in the literature about the topic revealed that problems were experienced by administrators, teachers, students, and parents during distance education (Can, 2020; Doğan ve Koçak, 2020; Giannini ve Lewis, 2020; Hilli, 2020; TEDMEM, 2020; UNICEF, 2020). These problems experienced linked to mandatory distance education included teachers and students requiring psychological support due to being away from school for long durations and spending long periods of time at home, teachers not being able to receive in-service training about the use of technology due to being caught unprepared by the pandemic, inadequacy in students accessing education services according to socioeconomic level, parents requiring support about the use of technology to assist their children, and deficiencies in methods, techniques and materials that teachers could use for distance education.

Research by Burke and Dempsey (2020) revealed that the inadequacy of technology integration by teachers during distance education was identified by many studies. In their research, Bakioğlu and Çevik (2020) identified that teachers were anxious during the distance education process and felt they were inadequate. Research in the literature revealed that class teachers of children in the concrete operations stage of basic education experienced problems with mandatory distance education during the COVID-19 pandemic. Research identified inadequacy in class teachers' preparation for online education, inadequacy of online and offline material content, inadequacy in producing new content using computer technologies and inadequacy in technology integration during mandatory distance education (Baran and Sadık, 2021; İncetaş ve Kaf, 2022). Yıldırım (2020) stated that the majority of class teachers did not have adequate knowledge and experience about distance education due to

habituation to face-to-face education and had difficulty due to not having adequate technological integration. Due to inadequacy about using computer technologies and integration with lessons in online teaching among class teachers employed in distance education during the COVID-19 pandemic, Can (2020) identified that students in the first stages did not have their social interaction needs met. Fidan (2020) identified that in spite of internal motivation of students coming to the fore in distance education, primary school teachers did not sufficiently motivate students.

Leading the main factors in problems during mandatory distance education, teachers' inability to use computer technologies and integrate it with lessons during online teaching, inadequacy in technology use and lack of technology integration or inadequacy in technology integration continue to be problems as identified by research in the literature. In this context, the need for class teachers to be equipped technologically to be able to reach their students and continue to guide them is an important problem. In the context of these explanations based on the literature, there is a need to investigate the technology integration of class teachers in online education for them to be able to better manage the COVID-19 pandemic and to strengthen their technological abilities. The aim of this research was to investigate the use of computer technologies during online teaching by class teachers employed during COVID-19 and the status of integration into lessons. In line with this basic aim, answers to the following questions were sought;

1) What was the distribution of use of technology by class teachers employed during the COVID-19 pandemic?

2) What was the distribution of integration of technology into lessons among class teachers employed during the COVID-19 pandemic?

3) Is there a relationship between levels of use of computer technologies and level of ability to integrate technology into lessons for class teachers employed during the COVID-19 pandemic?

Method

The research was designed with the quantitative method. The quantitative pattern may objectively observe cases and events, measure them, and represent them numerically. Quantitative research is numerical research where observations and measurements may be repeated and are performed objectively. The research was designed according to the relational screening model. The relational research dimension of the study investigated the technology use and integration during online education of class teachers employed during the COVID-19 pandemic in Rize province in terms of some variables. The aim here was to determine the presence or degree of variation between two or more variables and to obtain clues related to cause-outcome (Creswell, 2012).

Research Sample

According to information obtained from Rize Provincial Directorate of National Education through official communications, there were a total of 93 primary schools in Rize provincial center and counties during the 2020-2021 educational year. A total of 861 class teachers were employed in these primary schools. Due to the accessibility of the whole universe for the research, sampling of the whole universe was performed. With the aim of collecting data at times when mandatory distance education was performed during the COVID-19 pandemic, online forms were prepared for class teachers. The online forms were shared with the schools through official channels. In this process, returns for participation of class teachers in the online data collection process did not occur and the data collection process was not successful. As a result, data collection was postponed until face-to-face education began again. Research data were collected during the 2021 fall semester. A total of 800 printed forms were sent to all primary schools in Rize; however, due to difficulties reaching class teachers due to COVID-19, opinions from a total of 464 teachers were obtained as data for the research. Table 1 gives the demographic characteristics of the sample group in the research.

Table 1
The Information Related Sample Group Demographic Characteristics

Variable		f	%
School Placement Type	City	385	83.0
	Town	79	17.0
Gender	Female	341	73.5
	Male	123	26.5
Education Status	Undergraduate	411	88.6
	Master	53	11.4
Professional Experience	1-5 year	50	10.8
	6-10 year	77	16.6
	11-15 year	109	23.5
	16-20 year	89	19.2
	21 year and above	139	30.0
Weekly Technology Using Time	Never use	39	8.4
	1-2 hour	108	23.3
	3-5 hour	128	27.6
	6-10 hour	34	7.3
	11 hour and above	155	33.4
TISES Status of Receiving In-Service Trainig	Yes	274	59.1
	No	190	40.9

Research Instruments and Procedures

With the aim of collecting data in this research;

1) The "Technology Integration Self-Efficacy Scale" (TISES) developed by Wang, Ertmer, and Newby (2004) and adapted to Turkish by Ünal (2013) was used. The scale comprises 19 items. The scale has five-point Likert rating and includes two subscales of self-efficacy in making others use computer technologies (OCT) and self-efficacy in use of computer technology (UCT). The reliability coefficient for the Turkish sample was .94 according to Ünal (2013), with reliability coefficient of .88 for the UCT self-efficacy subscale and .92 for the OCT self-efficacy subscale.

2) The "Teachers' Information and Communication Technologies (ICT) Integration Approach Scale" (TCIAS) was developed by Tezci (2016) to determine teachers' approaches to use of technology in class based on TYPE I and TYPE II by Maddux and Johnson (2005) and the cultural integration theory of Yuen (2000). The scale comprises 20 items. The scale has five-point Likert rating and includes three subscales of traditional integration, cognitive constructivist integration and sociocultural integration. The scale had general reliability coefficient for the Turkish sample of .80 according to Tezci (2013) with reliability coefficients of .87 for the traditional integration subscale, .86 for the cognitive constructivist integration subscale and .78 for the sociocultural integration subscale.

Data Analysis

Quantitative data were analyzed using descriptive statistics. Additionally, ANOVA, t test and Pearson moment multiplication correlation were used to determine group points.

Ethical Procedures

Ethical Procedures Ethical Committee consent for current research was obtained from the Ethics Committee of Recep Tayyip Erdoğan University (Num: 216876; Date: 21/01/2022).

Results

The descriptive results related to use of technology and levels of ability to integrate it into lessons of class teachers are given in Table 2.

Table 2

Use of Technology and Levels of Ability to Integrate it into Lessons of Class Teachers

Scale	Subscales	n	x̄	sd
TISES	Making others use computer technology	464	50.15	9.36
	Use of computer technology		22.87	4.17
TCIAS	Traditional integration	464	31.35	5.17
	Cognitive Constructivist Integration		22.73	6.03
	Sociocultural integration		14.92	4.81

In Table 2, the lowest mean points for the Technology Integration Self-Efficacy Scale (x̄=22.87, sd=4.17) of teachers was for the use of computer technology, with highest points (x̄=50.15, sd=9.36) for the making others use computer technology. According to these results, the self-efficacy about technology integration of participants was at lowest levels for the use of computer technology subscale, while it was at highest levels for the making others use computer technology subscale. The lowest mean points for the Teachers' ICT Integration Approach Scale (x̄=14.92, sd=4.81) were for the sociocultural integration subscale, with highest points (x̄=31.35, sd=5.17) for the traditional integration subscale. According to these results, participants had lowest level of ICT integration approach for the sociocultural integration subscale, with highest levels for the traditional integration subscale.

The differentiation according to gender of use of technology and levels of ability to integrate technology into lessons of class teachers is given in Table 3.

Table 3

According to Gender of Use of Technology and Levels of Ability to Integrate Technology into Lessons of Teachers

Scale	Subscales	Gender	N	x	ss	t	sd	p
TISES	Use of computer technology	Woman	341	22.2	4.40	-5.615	462	.000*
		Man	123	24.6	2.75			
	Making others use computer technology	Woman	341	48.8	9.92	-5.305	462	.000*
		Man	123	53.8	6.26			
TCIAS	Traditional integration	Woman	341	30.9	5.33	-2.831	462	.005*
		Man	123	32.4	4.55			
	Cognitive constructivist integration	Woman	341	21.9	5.97	-4.543	462	.000*
		Man	123	24.8	5.72			
	Sociocultural integration	Woman	341	14.3	4.71	-4.085	462	.000*
		Man	123	16.4	4.78			

According to independent t test results in Table 3, teachers had different levels of use of technology according to gender [t (462)= -5.615, p< .05]. Male teachers (x̄=24.6) had more positive attitudes toward using computer technologies compared to female teachers (x̄=22.2). There was a significant difference in perceptions related to making others use computer technology [t (462) = -5.305, p< .05]. Male teachers (x̄=53.8) had more positive attitudes toward traditional integration compared to female teachers (x̄=48.8).

There was a significant difference in perceptions about traditional integration according to gender for teachers' ability to integrate technology into lessons [t (462) =-2.831, p<.05]. Male teachers (x̄=32.4) had more positive attitudes to traditional integration compared to female teachers (x̄=30.9). For perceptions about cognitive constructivist integration, there was a significant difference according to gender [t (462) = -4.543, p< .05]. Male teachers (x̄=24.8) had more positive attitudes to cognitive constructivist integration compared to female teachers (x̄=21.9). There was a significant difference according to gender for perceptions about sociocultural integration [t (462) = -4.085, p< .05]. Male

teachers ($\bar{x}$=16.4) had more positive attitudes to sociocultural integration compared to female teachers ($\bar{x}$=14.3).

The differentiation of use of technology and levels of ability to integrate it into lessons of class teachers according to seniority is given in Table 4.

Table 4
Teachers According to Seniority Use of Technology and Levels of Ability to Integrate it into Lessons

Scale	Subscales	Variance Source	KT	sd	KO	f	p
TISES	Use of computer technology	Between groups	123.372	4	30.843	1.785	.131
		Within groups	7930.126	459	17.277		
		Total	8053.498	463			
	Making others use computer technology	Between groups	685.825	4	171.456	1.970	.098
		Within groups	39940.31	459	89.016		
		Total	40626.14	463			
TCIAS	Traditional integration	Between groups	242.192	4	60.548	2.285	.059
		Within groups	12160.13	459	26.493		
		Total	12402.33	463			
	Cognitive Constructivist Integration	Between groups	462.431	4	115.608	3.235	.012*
		Within groups	16403.49	459	35.737		
		Total	16865.92	463			
	Sociocultural integration	Between groups	265.020	4	66.255	2.902	.022*
		Within groups	10480.49	459	22.833		
		Total	10745.51	463			

According to ANOVA results in Table 4, there was no statistically significant differentiation for the use of computer technology [F (4, 459) = 1.785, p> .05] and making others use computer technology [F (4, 459) = 1.970, p> .05] subscales according to the seniority variable for use of technology levels of teachers.

The ability of teachers to integrate technology into lessons did not differ in a statistically significant way according to seniority for the traditional integration [F (4,459) = 2.285, p> .05] subscale. There were statistically significant differences for the cognitive constructivist integration [F (4,459) = 3.235, p< .05] and sociocultural integration [F (4,459) = 2.902, p< .05] subscales.

The differentiation of class teachers' use of technology and ability to integrate it into lessons with receiving in-service training related to technology is given in Table 5.

Table 5
The Differentiation of Teachers' use of Technology and Ability to Integrate it into Lessons with Receiving In-Service Training Related to Technology

Scale	Subscales	Variance Source	KT	sd	KO	f	p
TISES	Use of computer technology	Between groups	5.951	1	5.951	.342	.559
		Within groups	8047.546	462	17.419		
		Total	8053.498	463			
	Making others use computer technology	Between groups	137.205	1	137.205	1.566	.211
		Within groups	40488.93	462	87.638		
		Total	40626.14	463			
TCIAS	Traditional integration	Between groups	20.164	1	20.164	.752	.386
		Within groups	12382.16	462	26.801		
		Total	12402.33	463			
	Cognitive constructivist integration	Between groups	1.758	1	1.758	.048	.826
		Within groups	16864.16	462	36.503		
		Total	16865.92	463			
	Sociocultural integration	Between groups	26.064	1	26.064	1.123	.290
		Within groups	10719.44	462	23.202		
		Total	10745.51	463			

According to the ANOVA results in Table 5, teachers' levels of use of technology did not statistically significantly differ for the use of computer technologies [F (4,462) = .342, p> .05] or making others use computer technologies [F (4,462) = 1.566, p> .05] according to the variable about receiving in-service training related to technology.

Teachers' level of ability to integrate technology into lessons did not statistically significantly differ for traditional integration [F (4,462) = .752, p> .05], cognitive constructivist integration [F (4,462) = .048, p> .05] and sociocultural integration [F (4,462) = 1.123, p> .05] in terms of receiving in-service training related to technology.

The differentiation in use of technology and levels of ability to integrate it into lessons of teachers according to hours of lessons given using technology is given in Table 6.

Table 6

The Differentiation in use of Technology and Levels of Ability to Integrate it into Teachers According to Hours of Lessons Given Using Technology

Scale	Subscale	Variance Source	KT	sd	KO	f	P
TISES	Making others use computer technology	Between groups	822.076	4	205.519		
		Within groups	39804.06	459	86.719	2.370	.052
		Total	40626.14	463			
	Use of computer technology	Between groups	321.782	4	80.446		
		Within groups	7731.715	459	16.845	4.776	.001*
		Total	8053.498	463			
TCIAS	Traditional integration	Between groups	43.817	4	10.954		
		Within groups	12358.51	459	26.925	.407	.804
		Total	12402.33	463			
	Cognitive constructivist integration	Between groups	476.798	4	119.200		
		Within groups	16389.12	459	35.706	3.338	.010*
		Total	16865.92	463			
	Sociocultural integration	Between groups	339.078	4	84.769		
		Within groups	10406.43	459	22.672	3.739	.005*
		Total	10745.51	463			

According to the ANOVA results in Table 6, teachers' level of use of technology did not statistically significantly differ for the making others use computer technologies [F (4,459) = 2.370, p> .05] subscale according to the hours of lessons given using technology. According to the ANOVA results, teacher's use of computer technology [F (4,459) = 4.776, p< .05] subscale had a statistically significant difference in terms of the hours of lessons given using technology variable.

The levels of teachers' ability to integrate technology into lessons did not statistically significantly differ for the traditional integration [F (4,459) = .407, p> .05] subscale according to the hours of lessons given using technology. According to the ANOVA results, the cognitive constructivist integration [F (4,459) = 3.338, p< .05] and sociocultural integration [F (4,459) = 3.739, p< .05] subscales had statistically significant differences in terms of the hours of lessons using technology of teachers.

The differentiation of class teachers' use of technology and levels of ability to integrate it into lessons according to educational status is given in Table 7.

Table 7

The Differentiation of Teachers' Use of Technology and Levels of Ability to Integrate it into Lessons According to Educational Status

Scale	Subscale	Variance Source	KT	sd	KO	f	p
TISES	Making others use computer technology	Between groups	261.930	1	261.930	2.998	.084
		Within groups	40364.21	462	87.368		
		Total	40626.14	463			
	Use of computer technology	Between groups	10.067	1	10.067	.578	.447
		Within groups	8043.431	462	17.410		
		Total	8053.498	463			
TCIAS	Traditional integration	Between groups	28.920	1	28.920	1.080	.299
		Within groups	12373.41	462	26.782		
		Total	12402.33	463			
	Cognitive constructivist integration	Between groups	29.263	1	29.263	.803	.371
		Within groups	16836.66	462	36.443		
		Total	16865.92	463			
	Sociocultural integration	Between groups	62.382	1	62.382	2.698	.101
		Within groups	10683.13	462	23.124		
		Total	10745.51	463			

According to the ANOVA results in Table 7, for teachers' levels of technology use, making others use computer technology [F (4,462) = 2.998, p> .05] and use of computer technology [F (4,462) = .578, p> .05] subscales did not statistically significantly differ according to the educational status variable.

For teachers' level of ability to integrate technology into lessons, traditional integration [F (4,462) = 1.080, p> .05], cognitive constructivist integration [F (4,462) = .803, p> .05] and sociocultural integration [F (4,462) = 2.698, p> .05] subscales did not statistically significantly differ according to the educational status variable.

To understand whether there was a correlation between the technology integration self-efficacy and teachers' ICT integration approaches investigated within the scope of the research, the Pearson correlation analysis from the parametric tests was performed. The results of the analysis are summarized in Table 8.

Table 8

Correlation Between Variables

		Teachers' ICT integration approaches
Teachers' level of use of education technologies	r	.629**
	P	.000
	N	464

When Table 8 is investigated, there was a significant correlation determined between the scale determining class teachers' level of use of education technologies and the scale measuring the ICT integration approaches of teachers (r=0.63, p<0.05). Accordingly, as the levels of use of educational technologies increased among teachers, their approaches to computer technology integration also increased.

Discussion and Conclusion

The results of the research determined that class teachers working during the COVID-19 pandemic had levels of use of technology and ability to integrate technology into lessons above the average. Though most class teachers working in primary schools have good levels of use of technology, it can be said that their ability to integrate technology into lessons is slightly lower. The inadequacy of teachers in using technology and their ability to integrate it into lessons was identified in many studies (Burke ve Dempsey, 2020; Yılmaz, 2019; Tezci, 2016; Turgut ve Başarmak, 2016). Research by Balanskat, Blamire and Kefala (2006) emphasized that teachers did not have sufficient skills about the use of

computer technologies and lacked interest in integrating technology into lessons. A study by İşman (2002) revealed that teachers did not see themselves as adequate for technology integration. Research by Bolat etal., (2020) identified that teachers did not adequately complete technology integration. Çırak and Demir (2014) identified that teachers were not aware of software related to their field, and required professional development about the topics of technology, pedagogy and content interactions in their research investigating the competencies required by class teachers to integrate technology into lessons. The results of studies by Arslan and Şumuer (2020) and Mohan et al. (2020) revealed that teachers had difficulty producing digital content linked to inadequate digital content during the mandatory distance education process. This situation revealed in the literature continued during COVID-19 and most research about the mandatory distance education process in Türkiye revealed that teachers were inadequate in terms of technology use and integration into lessons.

The results of the research revealed that male teachers had higher levels of computer technology use and ability to integrate it into lessons compared to female teachers. Results of research by Turgut and Başarmak (2019) are directly similar to these results and found that male teachers had higher levels of technology use and ability to integrate it into lessons. Contrary to these results, studies by Atlı and Mazman-Akar (2019) and Kaya (2017) revealed that generally self-efficacy perceptions about technology integration with integration approaches for information and communication technology of teachers did not differ according to gender.

The research results revealed that though the levels of use of technology by teachers did not differ according to seniority, their levels of ability to integrate technology into lessons did. Research by Orhan and Tekin (2019) and Turgut and Başarmak (2019) revealed that use of technology level did not differ according to professional seniority. Contrary to the results of these studies, research by Bolat etal., (2020) identified that teachers with professional seniority of twenty-one years or longer had lower levels of computer technology use and ability to integrate it into lessons compared to teachers with lower seniority. As seniority increased, the levels of computer technology use fell and the ability to integrate it into levels did not change. A study by Kaya (2017) observed that the use of technology in education by class teachers differed according to professional seniority and having computer certification. Russell et al. (2003) stated that young teachers were more comfortable using technology at higher levels, while experienced teachers were more successful at integrating technology into lessons. The results of research in the literature revealed that young teachers use more information and communication technologies during the education-teaching process compared to senior teachers, and they feel more competent about integrating technology into lessons (Kaya, 2017). A study by Atlı and Mazman-Akar (2019) identified that senior teachers were not more interested in the use of technology in classes.

The results of the research revealed that class teachers use of computer technology and level of ability to integrate it into lessons did not differ according to receiving in-service training related to technology and educational status. Research by Yılmaz and Üredi (2016) identified that teachers with doctorates actively used technology compared to teachers who were undergraduates. The results of a study by Atlı and Mazman-Akar (2019) revealed that the tendency of class teachers to use technology in lessons did not differ according to seeing themselves as competent about computer technologies and participation in in-service training related to computer technologies. Güneş and Özerbaş (2015) identified that the levels of use of education technology by class teachers did not differ according to participation in in-service training. The results of research by Topuz and Göktaş (2015) revealed that in-service training related to computer technologies did not achieve its aims, remained as theory and did not convert to practice and did not meet the needs of teachers. Research by Çalışkan (2017) identified that though teachers received in-service training about technology use, as a result of observations a limited number of teachers used technology and that the technology use did not extend beyond interactive blackboards. In this context, it can be said that in-service training about technology use and integration into lessons for teachers is not sufficient and does not achieve its purpose.

The results of the research revealed that the use of technology and levels of ability to integrate it into lessons of teachers differed according to hours of lessons using technology. Research directly supporting these results were not found in the literature. A similar result to this outcome of the research was identified in research by Gürbüztürk et al. (2015) and Kaya (2017) who found that young teachers

who followed developments in technology, spent more time on computers and participated in related courses had higher levels of ability to integrate technology into the education-teaching environment.

The results of the research revealed that the use of computer technology by class teachers was at low levels for sociocultural and technology integration of information and communication technologies, while there were moderate levels for making others use computer technologies for traditional integration and technology integration of information and communication technologies. This is directly similar to research by Tezci (2016). Research by Tezci (2016) found that there was low correlation between traditional integration with cognitive constructivist integration and sociocultural integration for integration approaches to information and communication technologies by teachers. A study by Bolat etal., (2020) found that middle school teachers had highest levels for traditional integration, moderate levels for cognitive constructivist integration and lowest levels for sociocultural integration for information and communication technologies. Research in the literature shows that in the context of technology use and integration into lessons, teachers mainly use traditional integration. Research about technology use by middle school mathematic teachers identified that teachers could use the Office programs, could research on the internet but had not heard of and could not use software in mathematic teaching. The results of many studies in the literature are directly similar to the results of this research. The results of many studies in the literature revealed that teachers used technologies requiring less information in the learning-teaching process like word processing programs (Word), calculation tables (Excel), presentation programs (Powerpoint), the internet, worldwide web, email, etc. with traditional style in the use of information and communication technologies (Alghazo, 2006; Önal ve Çakır, 2016; Thomas ve Stratton, 2006). According to the results of a study by Yılmaz and Üredi (2016) about the use of technology in education by primary school teachers, teachers knew word processing programs, internet-worldwide web and email use very well, knew the physical parts of computers, operating system, calculating table programs and presentation programs at moderate levels and were inadequate in terms of database programs and developing web pages.

The results of the research revealed that as the levels of use of education technologies by class teachers increased, their levels of ability to integrate computer technologies into lessons also increased. This result of the research is directly similar to the results of a study by Bolat etal., (2020) who observed that as the levels of use of computer technologies by middle school teachers increased, their levels of ability to integrate computer technologies into lessons increased. Research by Turgut and Başarmak (2019) and Bolat etal., (2020) found that middle school teachers had high levels of technology use and ability to integrate it into lessons. A study by Gürbüztürk et al. (2015) identified that, apart from skills requiring expertise, the self-efficacy perceptions about computer and internet use of class teachers were generally high.

Recommendations

In the context of experiences around the world and in Türkiye of the problems encountered about the use of computer technologies and integration into lessons during online teaching by class teachers during the COVID-19 pandemic, it is necessary to invest in the future of education with the appropriate use of technology in teaching programs in order to strengthen the technology integration of teachers. In this context, in-service activities centered on application should be implemented for teachers to acquire technology integration. Arslan and Şendurur (2017) stated that teachers should be centered in the technology integration process and that it was necessary to question the training given repeatedly. Research by Topuz and Göktaş (2015) emphasized that training given online should definitely be applied and that in-service training should be mandatory for all teachers. If teachers have skills in using information and communication technologies, it is recommended that teachers make organizations based on student interaction taking into account the needs of students in educational environments integrated with information and communication technologies during the compulsory distance education process and face-to-face education. In this context, it is recommended that there will be benefit in reviewing educational programs as a result of digital transformations so preservice teachers will be trained in technology.

References

Alghazo, I. M. (2006). Quality of internet use by teachers in United Arab Emirates. *Education*, *126*(4), 769-781.

Arslan, S., & Şendurur, P. (2017). Eğitimde teknoloji entegrasyonunu etkileyen faktörlerdeki değişim [Investigation of changes in factors affecting the technology integration in education]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi* [*Mehmet Akif Ersoy University Journal of Faculty of Education*], *43*, 25-50.

Atlı, Y., & S. G. Mazman Akar (2019). Sınıf öğretmenlerinin bireysel yenilikçilik özellikleri ile derste teknoloji kullanımına yönelik eğilimleri arasındaki ilişkinin incelenmesi [Examining the relationship between primary school chool teachers' individual ınnovativeness and tendency for technology use in class of]. *Uşak Üniversitesi Eğitim Araştırmaları Dergisi* [*Uşak University Journal of Educational Researc*], *5*(2), 1- 31.

Bakioğlu, B., & Çevik, M. (2020). COVID-19 pandemisi sürecinde fen bilimleri öğretmenlerinin uzaktan eğitime ilişkin görüşleri [Science teachers' views on distance education in the covıd-19 pandemic process]. *Turkish Studies*, *15*(4), 109-129. https://dx.doi.org/10.7827/TurkishStudies.43502

Baran, A., & Sadık, O. (2021). Covid-19 sürecinde sınıf öğretmenlerinin acil uzaktan öğretim tecrübelerinin ve görüşlerinin incelenmesi. [An examination of primary school teachers' emergency online teaching experıence and perceptions during Covid-19]. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi, [Journal of Uludag University Faculty of Education]. 34*(2), 813-854. https://doi.org/10.19171/uefad.882291

Balanskat, A., Blamire, R. ve Kefala, S. (2006). The ICT impact report. *European Schoolnet*, *1*, 1-71.

Bolat, D., Korkmaz, Ö., & Çakır, R. (2020). Ortaokul öğretmenlerinin bilişim teknolojilerini kullanım ve derslerine entegre edebilme düzeylerinin belirlenmesi. [Determination of the level of secondary school teachers to use information technologies and to integrate them into their courses]. *Ahmet Keleşoğlu Eğitim Fakültesi Dergisi [Journal of Ahmet Keleşoğlu Education Faculty]. 2*(2), 229-250.

Burke, J., & Dempsey, M. (2020). *Covid-19 practice in primary schools in Ireland report*. Ireland: Maynooth University.

Can, E. (2020). Coronavirüs (Covid-19) pandemisi ve pedagojik yansımaları: Türkiye'de açık ve uzaktan eğitim uygulamaları. [Coronavirus (Covid-19) pandemic and its pedagogical implications: Open and distance education applications in Turkey]. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi* [An examination of primary school teachers' emergency online teaching experıence and perceptions during Covid-19]. *6*(2), 11-53.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed). Upper Saddle River, NJ: Merrill.

Çakın, M., & Külekçi-Akyavuz, E. (2020). Covid-19 süreci ve eğitime yansıması: Öğretmen görüşlerinin incelenmesi. [The Covid-19 process and its reflection on education: An analysis on teachers' opinion]. *International Journal of Social Sciences and Education Research, 6*(2), 16-186.

Çalışkan, E. (2017). Eğitimde yenilikçi teknolojilerin kullanımı açısından Türkiye'de son beş yıl içerisinde (2011-2015) tamamlanmış lisansüstü tezlerin incelenmesi [Examination of Turkish master theses and doctoral dissertations in terms of using innovative technologies in education among 2011-2015]. *Journal of Human Sciences*, *14*(1), 496-505.

Çırak, S., & Demir, S. (2014). Sınıf öğretmenlerinin teknolojinin öğretime entegrasyonundaki öğretmen yeterliklerine ilişkin görüşlerinin irdelenmesi [Examining classroom teachers' views about their competencies concerning the integration of technology]. *Gaziantep University Journal of Social Sciences*, *13*(1), 99-113.

Doğan, S., & Koçak, E. (2020). EBA sistemi bağlamında uzaktan eğitim faaliyetleri üzerine bir inceleme [A study on distance learning activities in the context of the ECN system]. *Ekonomi ve Sosyal Araştırmalar Dergisi*, *[Journal of Economics and Social Research]*. *7*(14), 110-124.

Eğitim Reformu Girişimi (ERG). (2020). *Eğitim yönetişimi ve finansmanı: Eğitim izleme raporu [Education governance and financing: Education monitoring report]*. https://shorturl.at/wDMR9

Eğitim-Sen. (2020). *Pandemi koşullarında eğitim araştırması [Educational research under pandemic conditions]*. https://egitimsen.org.tr/pandemi-kosullarinda-egitim-arastirmasi/

Erbaş, Y. H. (2021). Covid-19 salgını döneminde eğitim: İlkokuma yazma öğretiminde karşılaşılan sorunlar ve çözüm önerileri [Education during the Covid-19 Pandemic: Problems Encountered in Reading and Writing Instruction and Suggested Solutions]. *Ana Dili Eğitimi Dergisi*, [Journal of Mother Tongue Education]. *9*(2), 360-380.

Fidan, M. (2020). Covid-19 belirsizliğinde eğitim: İlkokulda zorunlu uzaktan eğitime ilişkin öğretmen görüşleri [Education in the uncertainty of Covid 19: teachers' views on emergency remote teaching in primary school]. *Uşak Üniversitesi Eğitim Araştırmaları Dergisi [Uşak University Journal of Educational Researc], 6*(2), 24-43.

Giannini, S., & Lewis, G. S. (2020). Three ways to plan for equity during the coronavirus school closures. https://shorturl.at/fpKU0

Güneş, A. M., & Özerbaş, M. A. (2015). Sınıf öğretmenlerinin ilk okuma yazma sürecinde eğitim teknolojilerini kullanmaya yönelik görüşleri. [The views of primary school teachers concerning the use of educational technologies in teaching in the initial reading and writing process]. *Kastamonu Eğitim Dergisi [Kastamonu Education Journal], 23*(4), 1775-1788.

Gürbüztürk, O., Demir, O., Karadağ, M., & Demir, M. (2015). Sınıf öğretmenlerinin bilgisayar ve internet kullanımına ilişkin öz-yeterlik algılarının bazı değişkenler açısından incelenmesi [Examinations of primary school teachers' perceptions of computer and internet using selfefficacy in terms of some variables]. *Turkish Studies, International Periodical for the Languages, Literature and History of Turkish or Turkic*, *10*(11), 787-810.

Hilli, C. (2020). Distance teaching in small rural primary schools: A participatory action research project. *Educational Action Research*, *28*(1), 38-52.

Kaya, B. (2017). *Sınıf öğretmenlerinin eğitimde teknoloji kullanımına ilişkin tutum düzeyi ile mesleğe yönelik tutumları arasındaki ilişkinin incelenmesi [The relationship between attitude levels and vocational relationship on the use of technology in education in classroom teachers].* Ahievran University, Institute of Social Sciences, Niğde.

Ministry of National Education (*MoNE*). (2020a). *EBA TV ders yayını*. [*ECN TV lesson broadcasting*]. https://www.eba.gov.tr/

Ministry of National Education (*MoNE*)]. (2020a). *Uzaktan eğitim sürecinin detayları* [*Details of the distance education process*]. https://www.meb.gov.tr/uzaktan-egitim-surecinin-detaylari/haber/21990/tr

Ministry of National Education (*MoNE*)]. (2020b). *Basın açıklaması* [*Press release*]. http://www.meb.gov.tr/basin-aciklamasi/haber/22189/tr

Mohan, G., McCoy, S., Carroll, E., Mihut, G., Lyons, S. & Domhnaill, C. M. (2020). *Learning for all? Second-level education in Ireland during COVID-19*. ESRI Survey and Statistical Report Series Number 92.

İncetaş, F., & Kaf, Ö. (2022). Covid-19 salgın sürecinin öğrencilerin akademik ve sosyal davranışlarına yansımalarıyla ilgili öğretmen görüşleri [*Teachers' Views on the Reflections of the Covid-19 Epidemic Process on Students' Academic and Social Behaviors*]. *Ulusal Eğitim Dergisi* [*National Education Journal*], *1*(2), 156-175.

İşman, A. (2002). Sakarya ili öğretmenlerinin eğitim teknolojileri yönündeki yeterlilikleri [Sakarya province teachers' competencies in educational technologies]. *The Turkish Online Journal of Educational Technology*, *1*(1), 72- 91.

Orhan, A., & Tekin, İ. (2019). İngilizce okutmanlarının teknoloji yeterliliklerinin ve derste teknoloji kullanımına ilişkin tutumlarının incelenmesi [Investigation of english instructors' technology efficacy and their attitude towards technology use in class]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi* [*Mehmet Akif Ersoy University Journal of Faculty of Education*]. *49*, 81-101.

Önal, N., & Çakır, H. (2016). Ortaokul matematik öğretmenlerinin matematik öğretiminde bilişim teknolojileri kullanımına ilişkin görüşleri [Middle school mathematics teachers' views on using information technology in mathematics education]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi* [*Mersin University Journal of the Faculty of Education*], *12*(1), 76-94.

Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of Teacher Education*, *54*(4), 297-310

TEDMEM. (2020). *COVID-19 sürecinde eğitim uzaktan öğrenme, sorunlar ve çözüm önerileri* [*COVID-19 process, distance education learning, problem and solution suggestions*]. Ankara: Türk Eğitim Derneği Publishing.

Tezci, E. (2016). Öğretmenlerin BİT entegrasyon yaklaşımlarının ölçülmesine yönelik ölçek geliştirme [Developing a scale for measuring ICT integration approaches for teachers]. *Kastamonu Eğitim Dergisi [Kastamonu Education Journal],* *24*(2), 975-992.

Thomas, A., & Stratton, G. (2006). What we are really doing with ICT in physical education: A national audit of equipment, use, teacher attitudes, support, and training. *British Journal of Educational Technology*, *37*(4), 617-632.

Topuz, A., & Göktaş, Y. (2015). Türk Eğitim Sisteminde teknolojinin etkin kullanımı için yapılan projeler: 1984-2013 Dönemi [Projects for effective technology use in turkish education system: Period of 1984-2013]. *Bilişim Teknolojileri Dergisi* [*Journal of Information Technologies*], *8*(2), 99-110.

Turgut, G., & Başarmak, U. (2019). A review of technology ıntegration competencies of secondary school teachers according to various variables. *TAY Journal*, *3*(2), 51-66.

UNICEF. (2020). *COVID-19: More than 95 per cent of children are out of school in Latin America and the Caribbean*. https://www.unicef.org/press-releases/covid-19-more-95-cent-children-are-out-school-latin-america-and-caribbean

Ünal, E. (2013). *Öğretmen adaylarının teknoloji entegrasyonu öz-yeterlik algıları ve teknolojik pedagojik içerik bilgisi yeterlikleri arasındaki ilişkinin incelenmesi [An examination of the relationship between preservice teachers' perceptions of technology integratıon self-efficacy and technological pedagogical content knowledge competiencies].* Ankara University, Institute of Educational Sciences, Department of Computer and Instructional Technologies Education, Ankara.

Yıldırım, K. (2020). İstisnai bir uzaktan eğitim-öğretim deneyiminin öğrettikleri [Lessons From an Exceptional Distance Education Experience]. *Alanyazın Eğitim Bilimleri Eleştirel İnceleme Dergisi*, [*Cres Journal Critical Reviews in Educational Sciences*], *1*(1), 7-15.

Yılmaz, M., & Üredi, L. (2020). İlkokul öğretmenlerinin eğitimde teknoloji kullanımına ilişkin bilgisayar yeterliliklerinin değerlendirilmesi. *[The evaluation of primary school teachers' computer competency concerning the use of technology in education],* OPUS-*Uluslararası Toplum Araştırmaları Dergisi*, 16(*32*), 4723-4742, DOI: 10.26466/opus.779338

Yılmaz, O. (2019). *Öğretmenlerin BİT entegrasyon yaklaşımları, teknoloji entegrasyonuna yönelik öz-yeterlik algısı ve bireysel yenilikçilik özellikleri arasındaki ilişkiler. [Relationships among teachers' ICT integration approaches, self-efficacy towards technology integration and individual innovativeness features],* Necmettin Erbakan University, Institute of Educational Sciences, Department of Computer Education and Educational Technology, Konya.