

# EXPLORING TEACHERS' VIEWS ON EMOTION TRANSFER IN VIRTUAL CLASSROOMS DURING EMERGENCY REMOTE TEACHING

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## ABSTRACT

The present study explored emotion transfer-related views of teachers holding online classes in emergency remote teaching during the COVID-19 pandemic. We carried out the study with 630 teachers, the majority of whom were primary school teachers, serving at public and private K-12 schools. This was a descriptive survey study as it described the teachers' views as they were. The data were collected using the "Emotional Presence in Online Learning Scale" (EPOLS) and analyzed using descriptive statistics, independent sample t-test, and one-way analysis of variance (ANOVA). The findings revealed that the majority of teachers used the EBA Virtual Classroom application in emergency remote teaching while a small number of them utilized other virtual classroom applications. In addition, the teachers reported using messaging applications effectively, but it was not the case for social media. The private school teachers found virtual classroom applications efficient in transferring (conveying and receiving) emotions compared to public school teachers. The scores on the EPOLS and receiving emotions subscale pointed out that the female teachers found virtual classroom applications more effective than their male counterparts. Moreover, it was found that the preschool teachers and classroom teachers found virtual classroom applications more effective in receiving emotions than the high school teachers and middle school teachers, respectively. Finally, those with undergraduate and postgraduate education recognized emotion transfer in virtual classrooms more efficient than the teachers with an associate degree.

**Keywords:** Virtual classroom, emotion transfer, distance education, emergency remote teaching, COVID-19.

## INTRODUCTION

Virtual classrooms are synchronous learning environments to which students attend online from different places, which allow for mutual communication and visual transfer of information and offer interaction opportunities in various ways, and where sessions can be recorded for later viewing (Clark & Kwinn, 2007). Time and place-oriented flexibility and freedom, thanks to such breakthrough features, may be considered among the most prominent advantages of virtual classrooms (Raes et al., 2020; Teo et al., 2020). Christopher (2014) indicated that features such as content and screen sharing and tools for chatting, drawing, pointing, voting, instant feedback, and dividing the groups into smaller units are standard features of virtual classrooms.

It is deemed critical to encourage interaction, participation, and cooperation while designing and implementing practical online classes (Ward, Peters, & Shelley, 2010). In this sense, the use of tools specified above may boost interaction, participation, and collaboration (Kear et al., 2012). Moreover, such features of virtual classrooms contribute to social presence and improve the sense of belonging to the community upon eliminating the transactional distance caused by psychological and communication gaps between teachers and students (Giesbers et al., 2009; Loch & Reushle, 2008; Moore, 1993; McDaniels et al., 2016). Wegerif (1998) highlighted that the social dimension of online learning is a seminal predictor of the success of distance learners and concluded that building a sense of community is the very first step for creating a collaborative learning environment. Otherwise, students are likely to be reluctant to take risks involved in learning. Online faculty members are also

considered indispensable mediators of a strong sense of community through their teaching styles and attitudes of caring for their students (Palmer, 1998). Teaching in learning environments personalized by learning styles brings substantial impacts on student achievement (Eryilmaz & Jaballa, 2019; Duzgun, 2018).

Thanks to numerous tools and relevant approaches, synchronous virtual classes ultimately aim to offer a similar learning experience as in face-to-face classes in traditional classrooms (Elkins & Pinder, 2015). In this regard, virtual classrooms have gained fame in emergency remote teaching in the pandemic. Emergency remote teaching is different from distance education. Distance education is interdisciplinary and expressed by the distance in time and/or space between the learners and the educational content. While remote teaching refers to spatial distance, distance education brings diverse perspectives to “distance” and attempts to explain it with operational distance. In this sense, online distance education and emergency remote teaching are all different concepts (Bozkurt & Sharma, 2020). Thus, education carried out in the COVID-19 pandemic may be considered emergency remote teaching (Hodges et al., 2020) since it has appeared as a temporary solution to an urgent issue (Golden, 2020). Emergency remote teaching aims to provide learners with fast and reliable temporary access to learning in contrast to distance education that allows for building systematic models for the planning and design of instruction.

The unprecedented spread of COVID-19 (NCov–Novel Coronavirus), having emerged in China in December 2019, across the world (Chen et al., 2020; Hui et al., 2020), led the World Health Organization (WHO) to declare a pandemic in March 2020 (WHO, 2021). In Türkiye, the Ministry of National Education (MoNE) decided to close schools at all levels as of March 23, 2020 to alleviate the spread of the pandemic (MoNE, 2020-a). Immediately after the closure of schools, the MoNE introduced various applications to manage distance education. Accordingly, the Education Information Network (EBA), an integral part of the Movement to Increase Opportunities and Improve Technology (FATİH) Project initiated in Türkiye in 2010 to support formal education, was improved to serve as a distance education platform in the pandemic (MoNE, 2021-d). Hence, the “EBA Virtual Classroom” application was integrated into EBA to satisfy the need for virtual classrooms in emergency remote teaching. Although the practices of private schools differed, the MoNE introduced “EBA Virtual Classroom” on April 15, 2020 for 8<sup>th</sup>-graders, high school preparatory students, and 12<sup>th</sup>-graders. In addition, provided taking necessary safety and confidentiality measures, the MoNE allowed teachers to use free versions of some virtual classroom applications (e.g., Zoom, Microsoft Teams, Google Meet, Skype) for other grade levels (MoNE, 2020-b). Approximately 12.5 million students and 1 million teachers actively used EBA between September 21, 2020 (beginning of the first semester) - January 22, 2021 (end of the first semester). In addition, more than 40 million EBA Virtual Classroom applications were used on EBA, and a total of 155 million online classes were held until January 23, 2021.

Although offering many opportunities for interaction and participation, virtual classrooms bear more limitations regarding conveying visual cues (e.g., facial expressions) and interactions than traditional classrooms (Kear et al., 2012). It is well-documented the limitations in perceiving body language and gestures in virtual classrooms may make it difficult to elicit verbal responses from students, to identify those with difficulties in understanding the topic, and to get their feedback (Cornelius, 2014; Kear et al., 2012; Wang & Hsu, 2008). However, frequent eye contact between the teacher and students contributes to student achievement (Duzgun & Selcuk, 2018).

Despite long distances, it is called “Virtual Eye Contact” to interact and communicate by creating a synchronized copy of eye contact between teachers and students through live video in virtual classrooms (Yuzer, 2007). In crowded classrooms, it may be difficult for all students to make eye contact with the teacher, even if all the cameras are turned on. In this case, although the teacher does not see the students, eye contact can be copied for each student through specific techniques to reveal their eye contact behavior. Therefore, independent of place, students may look at their teacher’s virtual eyes simultaneously. Overall, the literature hosts many studies scrutinizing the effects of distance education and online learning on student achievement and exploring students’ attitudes toward online classes. What is commonly emphasized by these studies is that distance education and virtual classrooms are all effective in increasing student achievement, improving their motivation and self-confidence, and contributing to their communication skills with peers and teachers (Miltiadou & Savenye, 2003; Ozgur, 2015; Wang & Newlin, 2001). At this point, another prominent subject needing to be explored is emotion transfer in distance education.

## PURPOSE

The previous research reported robust correlations between emotions and cognition and behavior (Burlison & Planalp, 2000; Mayer, Salovey, & Caruso, 2002); therefore, emotions may be seminal for understanding social interaction (Andersen & Guerrero, 1998). It is well-known that emotions affect students' learning, school behavior, social relationships, and academic achievement, even teachers' teaching behavior in school settings (Brackett, Mayer, & Warner, 2004; Pekrun, Frenzel, Goetz, & Perry, 2007). In this sense, regarding cognitive learning and instructional behavior, it is also needed to explore how emotion transfer occurs in virtual environments. Yet, one may have certain barriers to expressing their emotions or recognizing others' emotions in virtual learning environments (Wang & Reeves, 2007). During text-based communication, the transfer of emotional messages may be challenged when emotions need to be conveyed in writing without non-verbal emotional cues. Han and Johnson (2012) emphasized that the lack of non-verbal emotional cues in virtual environments may restrict students' online interactions and their ability to perceive emotions. Nevertheless, McBrien, Cheng, and Jones (2009) reported that a synchronized online learning environment may facilitate student engagement and a positive online learning experience. In synchronized virtual classroom sessions, increasing the capacity to perceive emotions with non-verbal cues may also contribute to online students' sense of social presence, which is strongly associated with learning satisfaction and online learning achievement (Homer, Plass, & Blake, 2008; Richardson & Swan, 2003). Hence, the real-time interaction in virtual classrooms can facilitate the perception of verbal and non-verbal emotional cues. In this way, students feel less social distance when engaging in meaningful interaction with their teachers and peers (Moore, 1993). Non-verbal emotional cues, such as gestures and facial expressions, can also contribute to one's sense of being with others. Biocca (1997) aired that concretization, covering sensory interaction, motor interaction, and sensorimotor coordination in virtual environments, can affect one's sense of togetherness.

Many countries shifted to distance education due to the COVID-19 pandemic (WHO, 2021). In this emergency situation, schools deployed distance education using virtual classroom applications with diverse methods and tools to ensure the continuation of educational activities. In this period, the literature shifted its focus on teachers' views on distance education in virtual classrooms, particularly on the difficulty of using non-verbal communication in distance education (Wang & Reeves, 2007) regarding emotion transfer (Biocca, 1997). Therefore, the present study aimed to explore emotion transfer-related views of teachers holding online classes in emergency remote teaching during the pandemic. The relevant literature hosts studies on the nature of emergency remote teaching activities (Ferri, Grifoni, & Guzzo, 2020; Gillis & Krull, 2020; Jeffery & Bauer, 2020), the difficulties experienced by teachers in virtual classrooms (Khlaif, Salha, & Kouraichi, 2021; Zamora-Antuñano et al., 2021), and emotion transfer in distance education in the pandemic (Abel Jr, 2020; Aydin & Yuzer, 2006; Han, 2013; M. Amin & Sundari, 2020; Murphy, Eduljee, & Croteau, 2020; Sepulveda-Escobar & Morrison, 2020; Yuzer, 2007). Ultimately, the answers were sought for the following research questions:

1. How did the teachers use distance education tools during the pandemic?
2. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by school type?
3. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by teachers' gender?
4. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by school level?
5. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by teachers' educational attainment?
6. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by teachers' subject matter areas?
7. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by school location?

## METHOD

The present research employed a survey design as it described the teachers' views as they were. A survey design is an approach of descriptive research where phenomena and events are explored and described through the opinions and attitudes of larger samples (Karakaya, 2012). It is utilized to describe the structure of objects, communities, organizations, as well as the mechanism of phenomena (Cohen et al., 2007). The phenomenon, individual, or object that is the subject of research is described in its own conditions (Karasar, 2012). Survey research is often concerned with how opinions and characteristics are distributed within the sample rather than why they originate (Fraenkel & Wallen, 2006). Therefore, the present study explored the participating teachers' views on emotion transfer in virtual classroom applications by school type, level, and location and teachers' gender, educational attainment, and subject matter areas.

### Sample

The sample consisted of conveniently selected 630 teachers in Turkiye. While 521 (83%) served in public schools, 109 (17%) were employed in private schools. The majority of the teachers lived in Ankara ( $n = 548$ ; 87%), and the remaining 82 teachers (13%) were residents of 27 different cities. The research was carried out in the second semester of the 2019-2020 academic year with the teachers, the majority of whom were primary school teachers ( $n = 252$ , 40%), having held online classes at K-12 schools (preschool ( $n = 33$ ; 5%), primary school ( $n = 309$ ; 49%), middle school ( $n = 268$ ; 43%), and high school ( $n = 20$ ; 3%). While the participants were aged 23-64 years ( $M = 39$ ,  $SD = 8.23$ ), they had professional seniority of 1-41 years ( $M = 14.73$ ,  $SD = 7.80$ ). In the study, the researcher did not obtain the participants' personal information, except for their informed consent, and informed the participants that they might quit at any stage of the study.

### Data Collection Procedure and Analysis

The sample was selected among those having practiced emergency remote teaching through virtual classroom applications during the COVID-19 pandemic. The research sample was determined by adopting a maximum variation sampling technique, which is denoted as selecting diverse situations bearing similarities within themselves and working on these situations regarding the problem in the universe (Buyukozturk, Kilic Cakmak, Erkan Akgun, Karadeniz, & Demirel, 2018).

Although the relevant literature offers some instruments to measure emotion transfer in learning settings (Cleveland-Innes & Campbell, 2012; Kang, Kim, Choi, & Park, 2007; Ning, Young, Wilhite, & Marczyk, 2010; Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011), the Emotional Presence in Online Learning Scale (EPOLS) (Sarsar & Kislak, 2016) was used as the data collection tool since being validated for measuring emotion transfer in virtual classrooms in the Turkish language. In addition, the researcher, a distance education specialist, generated a demographic information form and a form to reveal the situation of teachers' participation in distance education. Then, the data collection tools were combined into a digital questionnaire booklet and sent to the participant online. The role of the researcher is limited only to collecting the data, which can be presented as numerically, by using measurement tools and explaining the findings through relevant statistical analyses on the data. All statistical analyses were performed on SPSS 26 and LISREL 8.80. The obtained data were first subjected to the Kolmogorov-Smirnov test to determine whether the data showed a normal distribution (Table 1).

**Table 1.** Normality of distribution

Factors	Statistics	n	$p$	$M$	Mode	Median	Skewness	Kurtosis
F1- Receiving Emotions	.143	630	.000	3.65	4.00	3.83	-.481	.000
F2- Giving Emotions	.087	630	.000	3.41	3.89	3.44	-.365	-.157
Total	.078	630	.000	3.53	3.89	3.61	-.401	-.081

\* $p < .05$

As in Table 1, the skewness and kurtosis values between +1.5 and -1.5 (Tabachnick, Fidell, & Ullman, 2019), as well as the overlapping mean, mode, and median values, for the overall EPOLS and its subscales indicated the normality of distribution. Therefore, the data were analyzed using parametric analyses, namely independent samples t-test and one-way analysis of variance (ANOVA). In the case of a significant difference as a result of ANOVA, the source of the difference was sought through the Tukey HSD test.

### Data Collection Tools

The research data were collected using a demographic information form and the EPOLS (Sarsar & Kislá, 2016). The demographic information form includes questions inquiring about school type, level, and location and teachers' gender, educational attainment, and subject matter areas. In addition, another form developed by the researcher covered questions about how the teachers carried out distance education practices during the pandemic. The EPOLS is a 5-point Likert-type scale and consists of 21 items within two subscales: receiving emotions and giving emotions. In the original study, the researchers calculated Cronbach's alpha coefficients to be 0.88 for the total score, 0.79 for the receiving emotions subscale, and 0.86 for the giving emotions subscale (Sarsar & Kislá, 2016). In this study, internal reliability coefficients were found as 0.92 for the total score, 0.91 for the receiving emotions subscale, and 0.82 for the giving emotions subscale.

Confirmatory Factor Analysis (CFA) was performed to validate the construct validity of the EPOLS. Accordingly, while  $\chi^2$  (424),  $\chi^2/df$  (2.26), NNFI (0.92), PNFI (0.79), CFI (0.93), IFI (0.93), ECVI (4.76 < 42.12), AIC (510.25 < 4085.76), and CAIC (664.40 < 41610.04) indices showed acceptable model-data fit, RMSEA (0.11), GFI (0.71), and AGFI (0.64) yielded values outside the cut-off values for an acceptable model-data fit. Overall, the model tested in the research showed an acceptable fit to the data (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999; Mulaik et al., 1989; Schermelleh-Engel, Moosbrugger, & Muller, 2003; Steiger, 2007; Wheaton, Muthen, Alwin, & Summers, 1977).

### Ethical Considerations

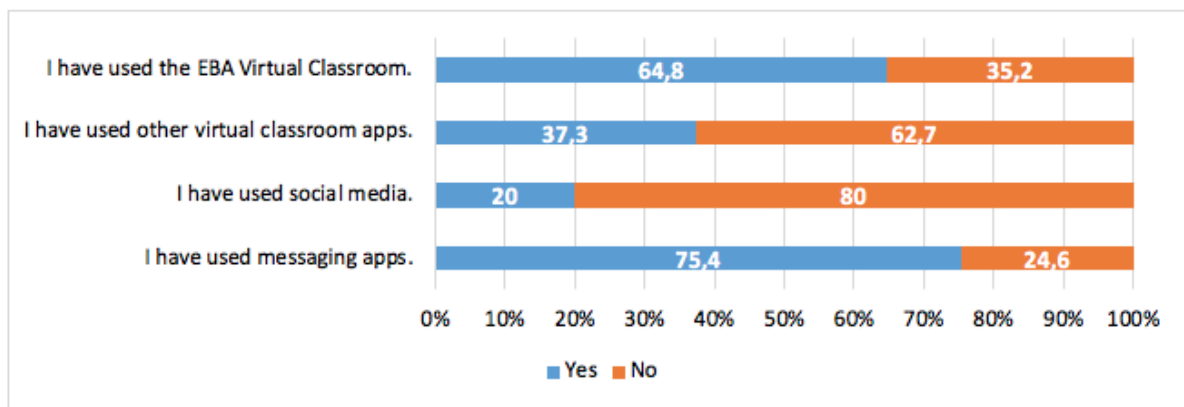
The responsible authors of the EPOLS provided relevant permission for the use of the scale via e-mail. Moreover, the Ethics Committee of Ankara Yildirim Beyazit University granted the ethical approval to the present study (No: 84892257-604.01.02-E.18220 dated 06.19.2020). The participants reading the pre-approval form and providing their voluntary consent were included in the study. No confidential information was collected from the participants who were free to quit at any stage of the study.

## FINDINGS

Table 2 presents what type of distance education tools the teachers used in the pandemic.

**Table 2.** Distance education tools preferred by the teachers during the pandemic

		<i>F</i>	%
I have used the EBA Virtual Classroom.	Yes	408	64.8
	No	222	35.2
I have used other virtual classroom apps.	Yes	235	37.3
	No	395	62.7
I have used social media.	Yes	126	20.0
	No	504	80.0
I have used messaging apps.	Yes	475	75.4
	No	155	24.6



**Figure 1.** Distance education tools preferred by the teachers during the pandemic (percentages)

It was found that the majority of the teachers (64%) utilized the EBA Virtual Classroom in emergency remote teaching during the pandemic. While 235 teachers (37.3%) used other virtual classroom applications, 126 (20%) employed social media applications. The rate of those using messaging applications was found to be 75.4% (Table 2, Figure 1).

Most of the teachers served at public schools (82.7%), while the others were employed in private schools (17.3%). Table 3 presents the comparison of the teachers' views on emotion transfer in virtual classrooms by school type.

**Table 3.** Teachers' views on emotion transfer in virtual classrooms by school type

	School type	N	M	SD	df	t	p
F1- Receiving Emotions	Public school	521	3.61	.62	628	3.57	.000*
	Private school	109	3.84	.57			
	Total	630					
F2- Giving Emotions	Public school	521	3.39	.65	628	2.36	.019*
	Private school	109	3.55	.64			
	Total	630					
Total EPOLS	Public school	521	73.75	12.50	628	3.24	.001*
	Private school	109	77.96	11.60			
	Total	630					

Note. \* $p < .05$

The teachers' scores on the EPOLS were compared through the independent samples t-test. As in Table 3, the teachers' giving emotions ( $p = .001$ ), receiving emotions ( $p = .019$ ), and total EPOLS scores ( $p = .000$ ) significantly differed by school type, indicating that their views on emotion transfer in virtual classrooms significantly differed by school type. The teachers employed in private schools got significantly higher scores on the overall EPOLS ( $M = 77.96$  vs.  $73.75$ ), receiving emotions subscale ( $M = 3.84$  vs.  $3.61$ ), and the giving emotions subscale ( $M = 3.55$  vs.  $3.39$ ) than the public school teachers (Table 3).

While 505 (80%) of the participating teachers were females, 125 (20%) were males. Table 4 presents the results of the t-test to compare the teachers' views on emotion transfer in virtual classrooms by gender.

**Table 4.** Teachers' views on emotion transfer in virtual classrooms by gender

	Gender	N	M	SD	df	t	p
F1- Receiving Emotions	Female	505	3,67	,60467	628	2,131	,044*
	Male	125	3,54	,65511			
	Total	630					
F2- Giving Emotions	Female	505	3,44	,65450	628	1,700	,090
	Male	125	3,33	,63628			
	Total	630					
Total	Female	505	74,99	12,32939	628	2,070	,039
	Male	125	72,42	12,72872			
	Total	630					

Note. \* $p < .05$

The findings showed that there were significant differences between the participants' scores on the overall EPOLS ( $p = .039$ ) and the receiving emotions subscale ( $p = .044$ ) by their gender. Yet, it was not the case on the giving emotions subscale ( $p = .090$ ). Accordingly, the female teachers scored significantly higher on the overall EPOLS ( $M = 74.99$  vs.  $72.42$ ) and the receiving emotions subscale ( $M = 3.67$  vs.  $3.54$ ) than their male counterparts (Table 4).

Thirty-three (5.2%) of the teachers worked at preschools, 309 (49%) at primary schools, 268 (42.5%) at middle schools, and 20 (3.2%) at high schools. Table 5 demonstrates the results of ANOVA to compare the teachers' views on emotion transfer in virtual classrooms by school level.

**Table 5.** Teachers' views on emotion transfer in virtual classrooms by school level

		SS	df	MS	F	p	Difference (Tukey)
F1- Receiving Emotions	Between groups	6.047	3	2.016	5.412	.001*	Preschool - High school Primary school - Middle School
	Within groups	233.164	626	.372			
	Total	239.211	629				
F2- Giving Emotions	Between groups	.407	3	.136	.318	.812	-
	Within groups	266.920	626	.426			
	Total	267.327	629				
Total EPOLS	Between groups	1190.073	3	396.691	2.582	.053	-
	Within groups	96175.198	626	153.635			
	Total	97365.271	629				

Note. \* $p < .05$

The teachers' scores on the overall EPOLS and the giving emotions subscale did not significantly differ by school level. Nevertheless, the findings revealed a significant difference between the scores on the receiving emotions subscale ( $p = .001$ ). A Tukey test was performed to uncover the source of the significant difference, and it was found that the preschool ( $M = 3.83$ ) and high school teachers ( $M = 3.37$ ) scored significantly higher on the receiving emotions subscale than the primary school ( $M = 3.72$ ) and middle school teachers ( $M = 3.56$ ), respectively (Table 5).

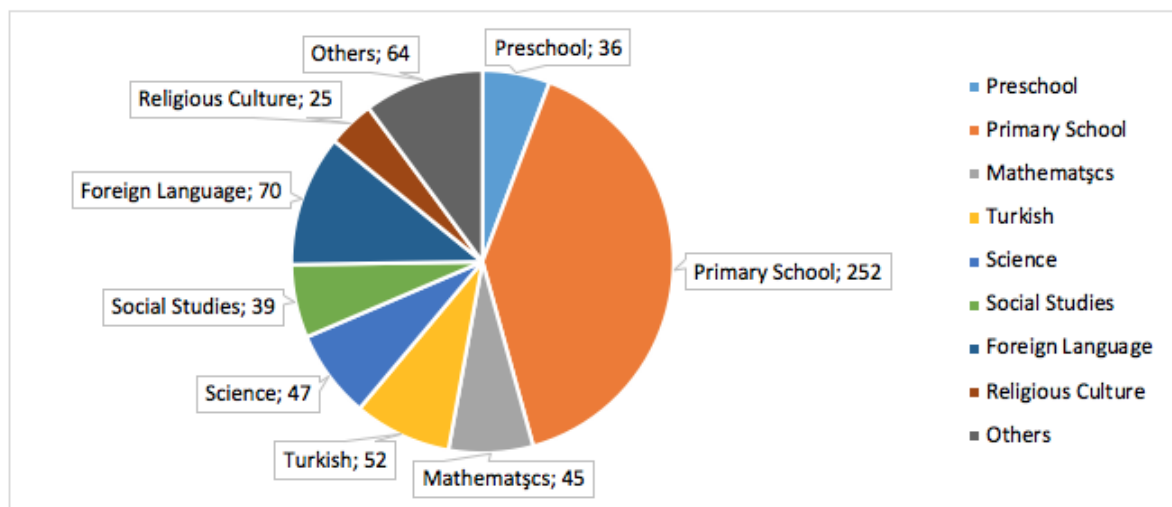
Twenty-four (3.8%) of the teachers graduated from an associate degree program, 540 (85.7%) from an undergraduate program, and 66 (10.5%) from a graduate program. Table 6 presents the results of ANOVA to compare the teachers' views on emotion transfer in virtual classrooms by their educational attainment.

**Table 6.** Teachers' views on emotion transfer in virtual classrooms by their educational attainment

		SS	df	MS	F	p	Difference (Tukey)
F1- Receiving Emotions	Between groups	2.608	2	1.304	3.456	.032*	Associate degree-Undergraduate degree
	Within groups	236.603	627	.377			
	Total	239.211	629				
F2- Giving Emotions	Between groups	7.440	2	3.720	8.975	.000*	Associate degree-Undergraduate degree
	Within groups	259.887	627	.414			
	Total	267.327	629				
Total EPOLS	Between groups	1853.485	2	926.743	6.084	.002*	Associate degree-Undergraduate degree
	Within groups	95511.786	627	152.331			
	Total	97365.271	629				

Note. \* $p < .05$

It was found that there were significant differences between the teachers' scores on the overall EPOLS ( $p = .002$ ), the receiving emotions subscale ( $p = .032$ ), and the giving emotions subscale ( $p = .000$ ) by their educational attainment. According to the results of the Tukey test, those who graduated from an undergraduate program ( $M = 3.35$ ) and a graduate program ( $M = 3.71$ ) scored significantly higher on the receiving emotions subscale than those with an associate degree ( $M = 3.33$ ) and an undergraduate degree ( $M = 3.65$ ), respectively. On the giving emotions subscale, there were significant differences between the teachers with an associate degree and an undergraduate degree ( $M = 2.98$  vs.  $3.41$ ), between those with an associate degree and a graduate degree ( $M = 2.98$  vs.  $3.62$ ), and between those having graduated from an undergraduate program and a graduate program ( $M = 3.41$  vs.  $3.62$ ). Finally, those with an undergraduate degree ( $M = 3.65$ ) and graduate degree ( $M = 3.71$ ) had significantly higher scores on the overall EPOLS than the teachers with an associate degree ( $M = 3.33$ ) and an undergraduate degree ( $M = 3.65$ ), respectively (Table 6). Figure 2 illustrates the distribution of the teachers by their subject matter areas



**Figure 2.** Distribution of the teachers by their subject matter areas



The majority of the teachers (40%) were classroom teachers, followed by Turkish (11.1%), science (8.3%), mathematics (7.5%), social studies (6.2%), preschool (5.7%), and religious culture teachers (4%). In addition, 6.2% of the teachers were with different subject matter areas. Table 7 presents the results of ANOVA to compare the teachers' views on emotion transfer in virtual classrooms by their subject matter areas.

**Table 7.** Teachers' views on emotion transfer in virtual classrooms by their subject matter areas

		SS	df	MS	F	p	Difference
F1- Receiving Emotions	Between groups	6.616	11	.601	1.598	.095	-
	Within groups	232.595	618	.376			
	Total	239.211	629				
F2- Giving Emotions	Between groups	3.340	11	.304	.711	.729	-
	Within groups	263.987	618	.427			
	Total	267.327	629				
Total EPOLS	Between groups	1694.800	11	154.073	.995	.449	-
	Within groups	95670.471	618	154.807			
	Total	97365.271	629				

Note. \* $p < .05$

The results of the ANOVA revealed no significant differences between the teachers' scores on the EPOLS by their subject matter areas (Table 7).

Most of the teachers (69%) worked in schools located in a city center, while 27.1% in a district, and 22 (3.5%) in a village/town. The comparison of the teachers' views on emotion transfer in virtual classrooms by school location is demonstrated in Table 8.

**Table 8.** Teachers' views on emotion transfer in virtual classrooms by school location

		SS	df	MS	F	p	Difference
F1- Receiving Emotions	Between groups	.914	2	.457	1,201	.302	-
	Within groups	238.286	626	.381			
	Total	239.200	628				
F2- Giving Emotions	Between groups	.434	2	.217	.510	.601	-
	Within groups	266.856	626	.426			
	Total	267.290	628				
Total	Between groups	279.085	2	139.542	.900	.407	-
	Within groups	97085.955	626	155.089			
	Total	97365.040	628				

Note. \* $p < .05$

The findings suggested no significant difference between the teachers' scores on the EPOLS by school location (Table 8).

## DISCUSSION AND CONCLUSION

As a result of the study, it was found that the majority of the teachers used the EBA Virtual Classroom application for emergency remote teaching in the COVID-19 pandemic, while an insignificant number of teachers used other virtual classroom applications and social media. It may be asserted that the teachers

consistently utilized virtual classrooms as they offered a unique solution to enable teachers to reach and support their students in a short time during emergency remote teaching (M. Amin & Sundari, 2020). It is also well-documented that effective communication between teacher and student in virtual classrooms contributes to student motivation (Yaslica, 2020; Yilmazsoy, **Ozdinc**, & Kahraman, 2018). **Unal** and **Bulunuz** (2020) reported that distance education gained efficiency thanks to the launch of the EBA Virtual Classroom application. However, despite MoNE's official correspondence that allowed teachers to use other virtual classroom applications other than the EBA Virtual Classroom application provided certain restrictions (MoNE, 2020-c), the teachers may have preferred other virtual classroom applications and social media less to avoid the desired restrictions. Palloff and Pratt (2013) stated that possible security and privacy concerns in social networks may reduce the use of these technologies. Therefore, the privacy concerns of teachers and students may have also influenced teachers' preferences of virtual classroom applications and social media as emergency remote teaching tools. According to Finkelstein (2013), although the camera view in virtual classrooms promotes a sense of closeness, the fact that students do not desire others to see their living spaces (Neuwirth et al., 2020) intensifies the privacy concerns in virtual classrooms.

The teachers used messaging applications effectively during emergency remote teaching, which may be because the teachers wanted to keep in contact with their students. Similarly, the previous research reported that messaging applications were prevalently preferred in emergency remote teaching (Demir & **Ozdas**, 2020; Goren, Gok, Yalcin, Goregen, & **Caliskan**, 2020; M. Amin & Sundari, 2020). In addition, messaging applications used to organize virtual classrooms and students' extracurricular assignments became prominent in this process (Demir & **Ozdas**, 2020). Duban and **Sen** (2020) are of the opinion that teachers should follow up their students and provide relevant academic and psychological support through live classes and texting on the phone or via WhatsApp. WhatsApp has the potential to provide a natural and unstructured learning environment; thus, it is recommended to support the use of WhatsApp and similar ones for educational purposes, considering their pros and cons (**Cetinkaya**, 2017).

Considering the teachers' opinions on emotion transfer in virtual classrooms by school type, it was found that the private school teachers often found virtual classroom applications more effective in receiving and conveying emotions compared to the public school teachers. Kurnaz, Kaynar, **Senturk** Barisik, and Dogrukok (2020) also concluded that private school teachers adopt more positive attitudes toward distance education. In addition, while there are studies suggesting that private school students have positive perceptions of distance education (Kaynar, Kurnaz, Dogrukok, & Barisik, 2020), some other studies concluded that public school students' perceptions of distance education are more positive (Barisik, Kurnaz, Kaynar, & Dogrukok, 2020). On the other hand, Agir (2007) asserted that school type does not make a significant difference regarding students' attitudes toward distance education. In-service training and guidance in private schools may enable private school teachers to gain effective communication skills. Besides, the number of students in classrooms often does not exceed 20 in private schools, although it may become 30 or more in public schools. Thus, a smaller classroom size may enhance emotion transfer of private school teachers in virtual classrooms. The above-mentioned finding may be explained by the willingness and determination of private school teachers and school administrators to use cameras in distance education. Yet, MoNE did not leave public schools flexible about the use of cameras in virtual classrooms and even recommended online classes without cameras unless necessary (MoNE, 2020-c).

Furthermore, the findings revealed that the preschool and primary school teachers found themselves better at receiving emotions than the high school and middle school teachers, respectively. Goren, Gok, Yalcin, Goregen, & **Caliskan**, (2020) documented that middle school teachers have a more positive view of the future of distance education. In addition, while it is often reported that middle school students show the highest participation in virtual classrooms, it is not the case for high school students Goren, Gok, Yalcin, Goregen, & **Caliskan**, (2020). Yilmaz and Guner (2020) stated that while primary school and high school students participated in distance education mainly through virtual classrooms and TV, respectively, during the pandemic, middle school students used both TV and virtual classrooms. On the other hand, Agir (2007) concluded that school level is an insignificant variable to create significant differences regarding students' attitudes toward distance education. Besides, younger students are thought to have an increased desire to communicate and interact with their teachers. Therefore, it can be deduced that preschools and primary schools encourage the use of virtual classrooms more, which may enhance emotion transfer in these schools than in others.

It was discovered that the teachers with an undergraduate degree and a graduate degree adopted a more positive approach to emotion transfer in virtual classrooms compared to their counterparts with an associate degree. Yet, Can and Gunduz (2021) stated that the educational attainment of teachers is not a significant factor predicting virtual classroom management competence. It will not be surprising that teachers with rich pre-service education are equipped with better classroom management and communication skills. Communication skills may be considered an important determinant of emotion transfer during teaching. It is thought that the readiness of the teachers with advanced education to use technology may have yielded the finding above.

By gender, the female teachers reported more positive views on receiving and conveying emotions in virtual classrooms than their male colleagues, which may be because women are more receptive than men in interpersonal relationships. Women are also better at perceiving nonverbal communication than men (Barletta, 2003). Non-verbal communication is a critical factor affecting emotion transfer in virtual classrooms. While there are overlapping findings in the literature (Can & Gunduz, 2021; Abu Aqel, 2012; Trotter, 2007; Al-Shammari, 2007), some studies reported a significant difference in favor of males (Atasoy, **Ozden**, & Kara, 2020; Er Turkuresin, 2020; Goren, Gok, Yalcin, Goregen, & **Caliskan**, 2020). On the other hand, some other studies revealed that participation in virtual learning does not differ by gender (Alakharas, 2018; **Cakir** & Arslan, 2020; Duzgun & Sulak, 2020).

On the other hand, the teachers did not significantly differ in their views on emotion transfer in virtual classrooms by their subject matter areas. There are controversial findings in the literature. Bayburtlu (2020) concluded that the participating pre-service Turkish teachers did not show the desired interest in online classes. Agir (2007) stated that the computer technology teachers adopted more positive attitudes toward distance education compared to their colleagues with other subject matter areas. Bawaneh (2020) noted that science students moderately utilized virtual classroom applications and did not significantly differ in satisfaction with distance education by science branches (physics, chemistry, biology). Duzgun and Sulak (2020) could not find any significant differences between pre-service primary school teachers and pre-service mathematics teachers by their views on distance education.

Similarly, the teachers did not significantly differ in their views on emotion transfer in virtual classrooms by school location. It would be appropriate to address this finding considering the conditions of emergency remote teaching. The restrictions due to the COVID-19 pandemic hindered students and teachers from leaving their homes. In that sense, the pandemic literally equalized big cities and villages. Goren, Gok, Yalcin, Goregen, & **Caliskan**, (2020) emphasized that participation in virtual classrooms did not differ by the locations of districts. However, he interestingly highlighted that those living in districts wanted to continue their distance education after the pandemic more than those living in city centers.

Overall, the findings in the present study may imply the following recommendations:

A substantial body of research uncovered that students and teachers suffered from insufficient technical infrastructure (e.g., computer, tablet, or Internet connection) during emergency remote teaching in the pandemic (Abel Jr, 2020; Ferri, Grifoni, & Guzzo, 2020; Yolcu, 2020). In addition, problems in sound and video equipment (microphone, headset, speaker, or camera) and poor internet infrastructure affected the participation of students in virtual classrooms and the teaching flow of teachers (Abel Jr, 2020; **Ozgul**, Ceran, & Yildiz., 2020). Hence, technology-related problems may be settled to improve the efficiency and use of virtual classrooms (Gillis & Krull, 2020; Biyikli & **Ozgur**, 2021). In this regard, the greatest share of the responsibilities falls upon governments. Governments need to support students and teachers financially for hardware spending and online subscriptions, provide disadvantaged students with free tablets and internet, and invest more in the telecommunication infrastructure.

Unlike physical classrooms, external noise may create significant problems in virtual classrooms (Sepulveda-Escobar & Morrison, 2020; Mohan et al., 2020; Yilmaz et al., 2020) since many participants from different places may turn a virtual classroom into a polyphonic environment although the virtual teaching seems to be conducted in a single shared environment. However, both teachers and students are expected to create suitable environments for themselves during their online classes (Johnson, 2020; Lynch, 2004). Therefore, participation in virtual classrooms in suitable settings (no distractors, noises, bright light, etc.) is deemed essential for the authenticity of the lessons (Shim & Lee, 2020; Christopher, 2014; Johnson, 2020). In other

words, the participants should be comfortable in terms of the physical environment and technical stuff.

A considerable number of studies previously touched upon communication barriers arising from the limited reception of visual cues (e.g., facial expression, body language) in virtual classrooms (Cornelius, 2014; Kear et al., 2012; Phelps & Vlachopoulos, 2020). Moreover, remaining silent and turning off cameras in virtual classrooms may bring other undesirable consequences as well (Cornelius, 2014; Neuwirth et al., 2020). In addition, it is highlighted that students' motivation for and interest and participation in classes were hit during the pandemic (Ferri, Grifoni, & Guzzo, 2020; Jeffery & Bauer, 2020; Mohan et al., 2020; Yilmaz et al., 2020). Demir and Kale (2020) reported that the lack of eye contact and adequate communication or interactions and the inaccessibility of all students, as well as the poor motivation of the students due to the pandemic, adversely affect education in virtual classrooms. Besides, if it is expected to perform effective teaching in an online environment, then it may not be sufficient only to transform the course content utilized in traditional face-to-face classrooms into digital format (Ko & Rossen, 2017). Thus, the lessons in virtual classrooms should be planned, presented, and evaluated in a way that encourages participation, interaction, and cooperation in line with the possibilities and limitations of these classrooms (Christopher, 2014; Clark & Kwinn, 2007). Furthermore, to support in-class communication and student engagement, teachers should enrich online classes with features of virtual classrooms for chatting, raising hands, voting, small group activities, whiteboard, as well as camera footage and screen sharing (Arslan & Sumuer, 2020; Peper, Wilson, Martin, Rosegard, & Harvey, 2021; Simon, 2022). The previous research that documented a positive relationship between interactive teaching materials and achievement consistently recommended developing interactive materials for virtual classroom environments (Moller, 1998; Karaman et al., 2013; Yaslica, 2020). It is also well-known that a number of fundamental technical and interactive aspects of teaching, such as teacher interaction in learning, course content, and assessment, affect learning-teaching and student satisfaction (Genc & Gumrukcuoglu, 2020; Horn, 1994).

It was previously determined that the trainer training program for distance education had a significant impact on the self-efficacy and benefit perceptions of the faculty members toward distance education (Ak, Gokdas, **Oksuz** & Torun, 2021). Such a finding may imply that teachers and pre-service teachers may be recruited to a series of training covering classroom management strategies specific to the virtual classroom settings, as well as traditional strategies (Can, 2020; Phelps & Vlachopoulos, 2020). In addition, time management plays an important role in the success of online learning (Caplan & Graham, 2008). The previous research indicated that satisfactory time management is an indispensable part of complex and demanding virtual classrooms (Cornelius, 2014; Phelps & Vlachopoulos, 2020; Tulaskar & Turunen, 2022). Upon watching the class recordings, teachers and pre-service teachers should be encouraged to make self-assessments and receive peer assessments about their time management and verbal and nonverbal behavior in virtual classrooms. In this way, feedback on verbal and nonverbal communication behavior in virtual classrooms will contribute to their professional development. In particular, pre-service teachers' awareness of their emotional reactions becomes much more important in raising their awareness of learning and teaching (Aydin & Yuzer, 2006).

The use and recording of the personal information of teachers and students in virtual classrooms often raise security and privacy issues (Khlaif, Salha, & Kouraichi, 2021). Today, personal data can easily be accessed even through a photograph, which may create concerns about the misuse of information. However, such concerns can be settled thanks to certain rules and procedures to be set by relevant authorities. Teachers, students, and parents should be regularly informed and guided about the security and privacy issues in virtual classrooms (Arslan & Sumuer, 2020).

One cannot deny the substantial impact of emotion transfer on distance education since proper identification of students' emotions inevitably contributes to an effective learning experience. Transforming negative affect into positive feelings mediates students' motivation, engagement, self-regulated learning skills, and academic achievement. To do so, teachers need to adopt educational leadership through new perspectives to learning, which may demand emotional awareness. Educational leadership is needed even greater in contemporary education, particularly in distance education. Revealing emotion transfer situations between teachers and students and, thus, attempting to create an emotional awareness of teachers may be considered the practical output of the research.

The present study employed a survey design to uncover an existing phenomenon with quantitative data. Overall, further research is recommended

- adopting a narrow or in-depth qualitative approach to investigate the underlying causes of emotion transfer-related issues in distance education,
- exploring the impacts of emotion transfer in distance education through an emotion transfer-specific experimental model,
- exploring the effects of emotion transfer in distance education through eye-tracking devices, EEG devices, FMRI devices, etc.,
- replicating the present study with students at different school levels.

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