



# Examining K-12 teachers' feelings, experiences, and perspectives regarding online teaching during the early stage of the COVID-19 pandemic

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## Abstract

This mixed-methods study explored K-12 teachers' feelings, experiences, and perspectives regarding online teaching during the COVID-19 pandemic. The study also examined teachers' perspectives of the “new normal” after COVID-19 and of what should be done to better prepare teachers for future emergencies. Both quantitative and qualitative data were collected from an online survey and follow-up interviews. A total of 107 teachers from 25 different states in the United States completed the online survey, and 13 teachers from 10 different states participated in the follow-up interviews. The results revealed teachers' feelings about online teaching and various strategies and tools they used during the early stage of the COVID-19 pandemic. The major challenges faced by teachers during the pandemic included lack of student participation and engagement (or lack of parental support), students without access to technology, concerns about students' well-being, no face-to-face interactions with students, no work-life balance, and learning new technology. Four major themes emerged regarding how to better prepare teachers for future emergencies: (1) professional development for online learning, (2) technology access, (3) technology training for both teachers and students, and (4) action plans and communication. Regarding teachers' perspectives of the “new normal,” five major themes emerged: (1) more online or blended learning, (2) rethinking normal, (3) hygiene and social distancing, (4) smaller classes and different school schedules, and (5) uncertainty and concerns about the “new normal.”

**Keywords** Challenges · COVID-19 · K-12 teachers · New normal · Online learning · Online teaching · School emergencies

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## Introduction

The largest online learning experience in history began in the spring of 2020 when 90% of schools worldwide closed due to the COVID-19 pandemic (UNESCO, 2020). In the wake of COVID-19, most of the world's students and teachers had to shift teaching and learning online within a matter of days or weeks (Ferdig et al., 2020; Hartshorne et al., 2020). Online learning, also known as e-learning, distance learning, virtual learning, or remote learning, is instruction that is based in a virtual environment where communication is solely facilitated using technological tools (Moore-Adams et al., 2016). Until the recent pandemic, the majority of online courses were offered in the higher education setting, with a relatively small percentage of K-12 students attending virtual schools or taking classes online (Pourreau, 2015; Wu, 2016).

Although the majority of research on online learning has been conducted in higher education, research on K-12 online learning continues to grow. However, this growing body of research is largely unknown to practitioners (Barbour, 2019). In addition, the COVID-19 pandemic is an unprecedented crisis and differs from other major school emergencies, such as school shootings and bomb threats. Therefore, it is assumed that many schools and teachers were not well prepared for the sudden move to online teaching due to the pandemic. This study aimed to capture K-12 teachers' feelings, experiences, and perspectives in the early stage of the COVID-19 pandemic and address how those experiences can inform schools and the education system so that they can better prepare teachers for online learning during the COVID-19 pandemic and potential future emergencies.

## Literature review

### The growth and effectiveness of online learning in K-12 education

Student enrollment in K-12 online programs has gradually increased over the last decade (Roy & Boboc, 2016; Zweig & Stafford, 2016). For the 2017–2018 school year, 297,712 students were enrolled in 501 full-time virtual schools, and 132,960 students were enrolled in 300 blended learning schools (Molnar et al., 2019). The COVID-19 pandemic spurred a dramatic increase in online learning in all learning settings, including K-12 education (Ferdig et al., 2020). Although the availability of the published research to inform the practice of K-12 online learning has not kept pace, the amount of research continues to grow (Barbour, 2019).

The majority of the research studies on K-12 online learning have focused on the effectiveness of online learning or comparisons of student performance between those enrolled in online and face-to-face environments (Cavanaugh et al., 2009; Rice, 2006). The comparative research studies have reported mixed results, but the general findings do not tell the complete story (Barbour, 2019), because comparative studies are often "challenged with issues of small sample size, dissimilar comparison groups, and differences in instructor experience and training" (Rice, 2006, p. 431). Rice (2006) concluded that the effectiveness of online learning has more to do with "who is teaching, who is learning, and how that learning is accomplished, and less to do with the medium" (p. 440).

## K-12 online learning: benefits and challenges

The literature reveals several benefits of online learning in the K-12 context. First, online learning offers flexible learning opportunities to those who cannot attend face-to-face classes for various reasons (e.g., competitive athletes, actors, the disabled, the hospitalized, or bully-victims) by allowing them to learn anytime, anywhere (Barbour & Harrison, 2016; Borup, 2016; Carpenter et al., 2015; Toppin & Toppin, 2016). Another benefit of online learning is differentiation and personalization. Online learning allows students to learn at their own pace and provides them with personalized learning experiences (Borup, 2016; Carpenter et al., 2015; Zheng et al., 2020). Online learning also makes learning more accessible by expanding learning opportunities for students. For example, it allows students to take courses that are not offered at their schools, such as Advanced Placement (AP) courses, due to budget constraints or shortage of qualified teachers (Archambault et al., 2016; Barbour & Harrison, 2016; Greene & Hale, 2017; Toppin & Toppin, 2016). Finally, online learning enables students to continue their education during unforeseen emergencies, such as natural disasters or pandemics (Trust & Whalen, 2020). Online learning is considered a viable approach to continue education when face-to-face education becomes inaccessible (Baytiyeh, 2018).

Despite these benefits, online learning can be challenging. Some of the major challenges include a lack of face-to-face relationships and a sense of community (Barbour & Harrison, 2016; Toppin & Toppin, 2016; Wu, 2016) and a lack of teacher preparation and training (Barbour & Harrison, 2016; Carpenter et al., 2015; Graham et al., 2019; Gurley, 2018; Nacu et al., 2016; Pourreau, 2015; Smith et al., 2016). While some challenges are inherent to online learning and teaching in general, the COVID-19 pandemic exacerbated some of those difficulties. The literature reveals several challenges that teachers faced during the pandemic. Hartshorne et al. (2020) identified four major challenges under the umbrella of equity issues, which include the 'homework gap', digital divide, mental wellness, and accessibility issues. The sudden lack of face-to-face interactions between teachers and learners and a lack of support at home widened the "homework gap," which refers to the lack of the connectivity students need to complete schoolwork at home (Clausen et al., 2020; Daniel, 2020; Reimers & Schleicher, 2020). The stress coming from a sudden change of routine and uncertainty about the effect of the pandemic, as well as economic and health concerns, created an increased interest in students' and teachers' mental wellness. Scholars promptly grew alarmed about prioritizing mental health (Holmes et al., 2020; Kaplan-Rakowski, 2021) even at the expense of opting out of teaching (Morales et al., 2020). Other challenges during the pandemic relate to a digital divide, the disparity between those with access to internet technology and those without (Van Dijk, 2006), and accessibility issues (e.g., lack of access to digital devices or the Internet). Hall et al. (2020) stressed the importance of addressing the digital divide even after the pandemic. Further, they suggested that teachers should better utilize existing resources and continue collaboration between scholars and educational technology specialists with the goal of "ethical, equitable, and culturally responsive technology integration in post COVID-19 instruction" (p. 439).

## Models, frameworks, standards, and strategies for quality online teaching

Online teaching is quite different from classroom teaching and requires a different set of skills even though there are some similarities (An, 2021; Davis et al., 2007; Morris, 2002). Researchers have proposed a variety of principles, models, frameworks, and standards for quality online teaching. For example, Barbour (2007) proposed seven principles of effective online course design for adolescent learners. The principles include (1) development preparation, (2) simple navigation, but diverse content presentation, (3) summary and personalization, (4) clear instructions and expectations, (5) the use of text and visuals, (6) smart use of multimedia and interactive elements, and (4) targeting relevant audience. McCombs and Vakili (2005) developed a learner-centered framework for e-learning based on the American Psychology Association's (APA) 14 learner-centered principles. Bonk (2006) proposed the R2D2 model—read, reflect, display, and do—for designing and delivering online learning. The Virtual Learning Leadership Alliance (VLLA) and Quality Matters (QM) (2019) have reshaped and updated the National Standards for Quality Online Learning, building upon the work started by the International Association for K-12 Online Teaching (iNACOL).

Researchers have also investigated effective online teaching strategies. For example, DiPietro (2010) explored the perspectives of successful K-12 virtual school teachers and reported five comprehensive beliefs; these included connecting with students, fluid practice, engaging students with the content, managing the course, and supporting student success. The beliefs were described in terms of their inherent goals and practices. For online teaching in K-12 schools, Morgan (2020) advised that schools should follow the International Society for Technology in Education (ISTE) guidelines when moving courses online. These guidelines embrace the importance of ensuring equity, fostering clear communication, developing student-centered learning, and utilizing high-quality resources. More research is needed to investigate appropriate teaching strategies and tools for K-12 education during the COVID-19 pandemic.

Regarding digital tools for online teaching, researchers found that video-conferencing tools such as Zoom were particularly useful when schooling was transferred to the online format. They served as a tool for communication for synchronous classes (Lowenthal et al., 2020) and for humanizing online classes, simultaneously addressing students' mental well-being (Kaplan-Rakowski, 2021). Besides video-conferencing tools, other tools employed during and after the transfer to online teaching included tools for screencasting (Ranellucci & Bergey, 2020), home-to-school communication (Mahaffey & Kinard, 2020), personalized professional learning (Conan, 2020), audio feedback (Fitzpatrick et al., 2020), digital storytelling (Caudill & Reilly, 2020), and more playful activities such as digital escape rooms (Neumann et al., 2020).

## Preparing teachers for emergencies

Prior to the COVID-19 outbreak, researchers investigated the ways to enhance teachers' preparedness for school emergencies such as school shootings and bomb threats. For example, Perkins (2018) examined teachers' preparedness for a school crisis and their perceptions of the effectiveness of school emergency drills. Tipler et al. (2018) explored how different stakeholders (school leaders, staff, and parents) responded to school emergencies. Focusing on crisis preparedness of online educators, McBrayer et al. (2020) examined

perceptions of crisis frequency and preparedness of online educators in a public K-12 online charter school in the southeastern region of the United States (US). The study reported the percentage of participants who felt “very prepared” in various crisis areas, including suicidal ideations (53.1%), abuse (47.6%), neglect (45.8%), natural disasters (18.9%), homicidal ideations (18.9%), unexpected death of a student (9.8%), unexpected death of a teacher (7.7%), and terrorist threats (7.7%). Suicidal ideations (53.1%) appeared to be the only area, for which more than 50% of the participants felt very prepared. These findings suggest a need for crisis management planning and training for online educators. McBrayer et al. (2020) argued that educators need to be up to date on evidence-based practices for school safety and security through professional learning that is purposeful, collaborative, and sustainable.

Given that the COVID-19 pandemic is an unprecedented crisis and differs from other major school emergencies, such as school shootings, previous research findings and guidelines are not directly useful for preparing teachers for the pandemic. Mohammed et al. (2020) argued that instructors in higher education should develop new skills needed to effectively transfer the face-to-face class to online and redesign the curriculum when emergencies such as COVID-19 occur. In a similar vein, Trust and Whalen (2020) claimed that K-12 teachers should develop online teaching skills. More research is needed to further examine what should be done to better prepare K-12 teachers for future emergencies such as COVID-19.

### **Different perspectives of the “new normal” after COVID-19**

Scholars in different fields have shared their perspectives of the “new normal” after COVID-19. For example, scholars from healthcare service organizations emphasized that all individuals need to develop healthcare prevention tactics, including improved personal hygiene, management of social distance, and wearing masks in public places, to avoid the re-occurrence of the pandemic (Abayadeera, 2020; Ingrassia, et al., 2020). In the business field, Ahlstrom et al. (2020) discussed economic, demographic, socio-political, and technological components of the “new normal” and argued that it is important to remember that the world is round, and events on one side of the globe can have significant implications for organizations on the other side of the globe. In the education community, Morales (2020) believed that going back to a “new normal” classroom would not be an easy task, and that it would involve much more than offering technologies for everyone. While the literature shows different perspectives of the “new normal” in different fields, few studies focused on K-12 teachers' views of the “new normal.” It is critical to understand K-12 teachers' perspectives of the “new normal” to get better prepared for it.

### **Purpose of the study**

To gain an in-depth understanding of K-12 teachers' feelings, experiences, and perspectives regarding online teaching during the COVID-19 pandemic, the present study explored how K-12 teachers felt about online teaching, what strategies and tools they used to teach online, and what challenges they faced in the spring of 2020. Further, the study examined the teacher perspective of the “new normal” after COVID-19 and what should be done to better prepare teachers for future emergencies. The following questions guided the study: (1) How do teachers feel about online teaching during the COVID-19 pandemic? (2) What

strategies and tools do teachers use to teach online during the COVID-19 pandemic? (3) What are the major challenges faced by teachers during the COVID-19 pandemic? (4) What should be done to better prepare teachers for future emergencies? and (5) What are teachers' perspectives of the "new normal" after COVID-19?

## Methods

Using a mixed-methods design (Creswell & Plano-Clark, 2017), we collected both quantitative and qualitative data from an online survey and follow-up interviews. The mixed-methods approach provided a more thorough understanding of K-12 teachers' feelings, experiences, and perspectives related to online teaching during the COVID-19 pandemic.

### Online survey

The survey was created using Google Forms. The survey questions were reviewed by two experts in the field of online learning and teaching and three K-12 teachers, and revisions were made based on their feedback. The final survey consisted of 12 demographic questions, 14 open-ended questions, 10 Likert-scale items, five select-all-that-apply items, four multiple-choice items, and one yes-or-no item. A 5-point scale was used for the Likert-scale items (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree). In terms of the content of the survey, the questions focused on teachers' feelings about online teaching, online teaching approaches and strategies, online learning platforms and technology tools, online communication and meetings, challenges and difficulties, how to prepare teachers for future emergencies, and teachers' perceptions of the "new normal." The actual items will be shown in the "Results" section.

The target population was K-12 teachers teaching online due to the COVID-19 pandemic. To recruit participants, the researchers sent email invitations and also posted the research information and the link to the online survey on K-12 teachers' Facebook groups, including Global Educator Collective and Ed Tech Ideas during COVID-19.

### Participants

A total of 110 teachers completed the survey, but the responses from three teachers from outside the US were removed to focus on the teachers in the US. The remaining 107 teachers were from 25 different states in the US. Most participants were female (91.6%) and Caucasian (76.6%). More than half of the participants (57%) reported teaching in a Title I school.

To determine if our sample is representative of the population of K-12 teachers in the US, we compared our sample's demographic data with those of the target population from the National Center for Education Statistics (NCES, 2019). As Table 1 shows, our sample is very close to the overall NCES distribution in terms of age and ethnic/racial characteristics. Meanwhile, our sample is somewhat skewed towards females (91.6% compared to 76.5%) and secondary grade-level teachers (61.7% compared to 49.8%). We discuss the implication of this imbalance in the limitations section.

**Table 1** Participants' demographic information

Demographic information	<i>N</i>	Sample %	National center for education statistics (NCES) %
<b>Gender</b>			
Female	98	91.6	76.5
Male	9	8.4	23.5
<b>Age</b>			
20–29	15	14	15
30–39	26	24.3	27.9
40–49	33	30.8	29
50–59	23	21.5	20.7
60 and older	10	9.3	7.4
<b>Ethnicity</b>			
African American	5	4.7	6.7
Asian	1	0.9	2.1
Caucasian	82	76.6	79.3
Hispanic American	13	12.1	9.3
Multiple ethnicities	6	5.6	1.8
<b>Grade level</b>			
Grades PreK-2	13	38.3	50.2
Grades 3–5	28		(Elementary)
Grades 6–8	29	61.7	49.8
Grades 9–12	37		(Secondary)
<b>Teaching experience</b>			
0–2 years	4	3.7	9 (less than 3)
3–10 years	30	28	28.3 (3 to 9)
11–20 years	37	34.6	39.9 (10 to 20)
More than 20 years	36	33.6	22.8 (more than 20)
<b>School</b>			
Public school	89	83.2	
Charter school	5	4.7	
Private school	13	12.1	

## Follow-up interviews

At the end of the online survey, the participants were asked whether they would like to participate in a follow-up interview. Thirteen teachers from 10 different states participated in the follow-up interviews. Table 2 summarizes the interviewees' demographic information. The semi-structured interview sessions included six questions, which focused on their online teaching experience, challenges and issues, and support needs during the COVID-19 crisis. Interviews were conducted through Zoom, a videoconferencing tool. Each interview lasted 15–25 min. With the interviewees' permission, the interviews were audio and video recorded.

**Table 2** Interviewee information

	Gender	Age	Grades	Teaching experience (years)	State
1	F	40–49	6–8	11–15	Texas
2	M	50–59	6–8	More than 20	Pennsylvania
3	F	50–59	3–5	16–20	California
4	F	30–39	6–8	3–5	Arizona
5	F	40–49	6–8	More than 20	Missouri
6	F	40–49	9–12	16–20	Pennsylvania
7	F	50–59	9–12	More than 20	Massachusetts
8	F	50–59	3–5	More than 20	Georgia
9	F	50–59	3–5	More than 20	Texas
10	M	30–39	6–8	6–10	Louisiana
11	F	50–59	9–12	More than 20	New Mexico
12	F	40–49	9–12	16–20	Colorado
13	M	30–39	9–12	11–15	California

## Data analysis

Quantitative data from closed-ended items, including Likert-scale items, select-all-that-apply items, multiple-choice items, and yes-or-no items, were analyzed using descriptive statistics (frequencies, percentages, means, standard deviations), Spearman correlations, Kruskal-Wallis, and one-way ANOVA to answer the Research Questions 1 (feelings) and 2 (strategies and tools). Qualitative data from open-ended questions and follow-up interviews were carefully examined and coded for thematic analysis (Miles et al., 2014) to answer the Research Questions 3 (major challenges), 4 (how to prepare teachers for future emergencies), and 5 (perspectives of the “new normal”). The following five-step procedures proposed by Thomas (2006) were used for thematic analysis: (1) preparation of raw data files (data cleaning and printing), (2) close reading of text, (3) creation of categories or themes, (4) overlapping coding and uncoded text, and (5) continuing revision and refinement of category system. To improve the reliability of the study, two researchers coded the part of the qualitative data individually and discussed the discrepancies in the coding categories until a consensus was reached. Then one researcher coded all the qualitative data and identified themes, which were reviewed and discussed by other researchers. Six major themes related to challenges, four themes related to preparing teachers for future emergencies, and five themes related to perspectives of the “new normal” were identified.

## Results

### Research question 1: How do teachers feel about online teaching during the COVID-19 pandemic?

Ten Likert-scale items were used to measure how teachers felt about online teaching. For each Likert-scale item, participants used a 5-point scale to indicate the extent to which they agreed or disagreed with each statement. A Cronbach  $\alpha$  of 0.88 indicates that the ten



**Table 3** Feelings about online teaching

Statements	<i>M</i>	<i>SD</i>
1. I have knowledge and skills for online teaching	4.07	.988
2. I am comfortable with teaching online	3.91	.986
3. <i>I am not ready to teach online</i>	3.94	1.097
4. I am confident with online teaching	3.84	1.029
5. I want to learn more about online teaching	3.66	1.165
6. <i>I am struggling with online teaching</i>	3.54	1.215
7. Online teaching is challenging but rewarding	3.39	1.122
8. I am enjoying teaching online	3.22	1.246
9. <i>Online teaching is stressful</i>	2.49	1.284
10. I prefer online teaching to classroom teaching	2.28	1.272

Items in italics were reverse coded

items were highly reliable measures of feelings towards online teaching. Table 3 reports the means (*M*) and standard deviations (*SD*) in rank order.

Approximately 80% of the participants agreed or strongly agreed that they had knowledge and skills for online teaching ( $M=4.07$ ,  $SD=0.988$ ), 73% felt comfortable with teaching online ( $M=3.91$ ,  $SD=0.986$ ), and nearly 70% were confident with online teaching ( $M=3.84$ ,  $SD=1.029$ ). However, 66% wanted to learn more about online teaching ( $M=3.66$ ,  $SD=1.165$ ).

A little more than half of the participants (51%) found online teaching challenging but rewarding ( $M=3.39$ ,  $SD=1.122$ ), and 44% were enjoying teaching online ( $M=3.22$ ,  $SD=1.246$ ). On the other hand, 21% indicated that they were struggling with online teaching ( $M=2.46$ ,  $SD=1.215$ ), and 11% felt that they were not ready to teach online ( $M=2.06$ ,  $SD=1.097$ ). Approximately 60% found online teaching stressful ( $M=3.51$ ,  $SD=1.284$ ). Only 19% preferred online teaching to classroom teaching ( $M=2.28$ ,  $SD=1.272$ ).

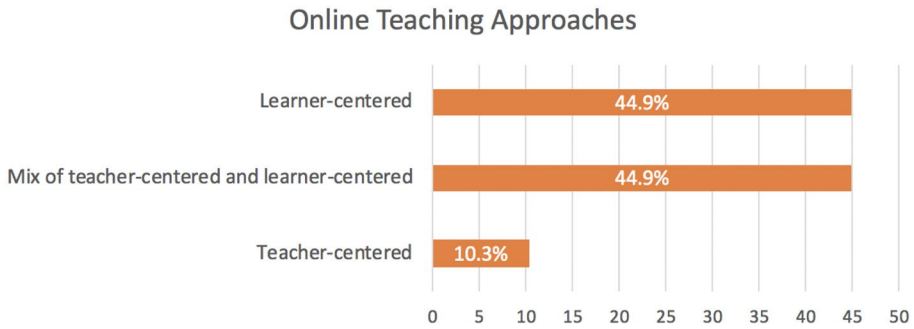
Further analyses were conducted to examine how participants' age or teaching experiences were related to their feelings about online teaching. The results of the analyses showed that the correlation between feelings about online teaching and participants' age was close to zero and insignificant,  $r_s=0.045$ ,  $p=0.644$ . Further, there was close to zero correlation (also insignificant) between feelings about online teaching and years of teaching experience,  $r_s=0.022$ ,  $p=0.822$ . For robustness, we also ran other tests including Kruskal–Wallace tests for differences in medians and one-way ANOVA to evaluate differences in means. None of the tests showed any association between the teachers' feelings about online teaching and their age or years of teaching experience.

## Research question 2: What strategies and tools do teachers use to teach online during the COVID-19 pandemic?

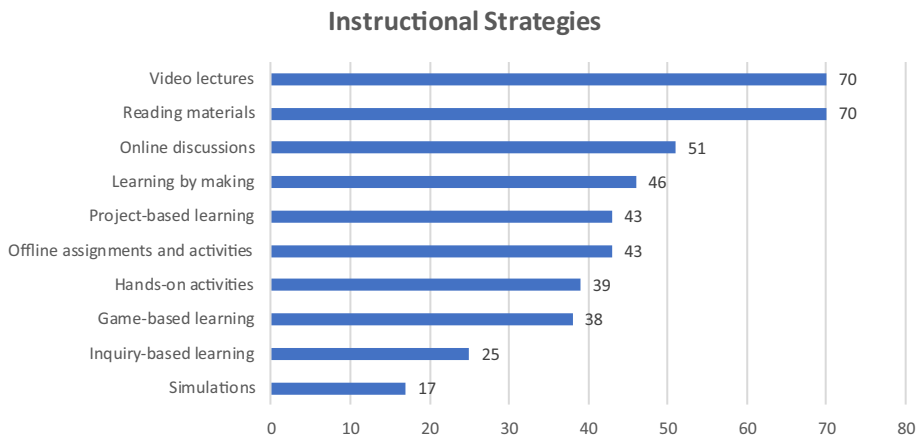
Approximately 90% of the participants started teaching online between March 11 and March 31, and 8.8% started online teaching in April, 2020.

### Online teaching approaches and strategies

Approximately 45% of the participants reported using “learner-centered” teaching strategies, while only about 10% indicated using “teacher-centered” approaches. The rest (45%)



**Fig. 1** Online teaching approaches



**Fig. 2** Major instructional strategies. Participants were asked to select all strategies that applied

appeared to use the “mix of teacher-centered and learner-centered” teaching strategies for their online classes (see Fig. 1).

Participants were asked to report their instructional strategies via a select-all-that-apply question. As Fig. 2 indicates, the major instructional strategies used by the participants included video lectures ( $n=70$ , 65.4%), reading materials ( $n=70$ , 65.4%), online discussions ( $n=51$ , 47.7%), learning by making ( $n=46$ , 43%), project-based learning ( $n=43$ , 40.2%), offline assignments and activities, such as printable activities, family activities ( $n=43$ , 40.2%), hands-on activities ( $n=39$ , 36.4%), game-based learning ( $n=38$ , 35.5%), inquiry-based learning ( $n=25$ , 23.4%), and simulations ( $n=17$ , 15.9%). To assess student learning online, the participants used online quizzes or exams ( $n=55$ , 51.4%), projects ( $n=53$ , 49.5%), discussions ( $n=41$ , 38.3%), and presentations ( $n=29$ , 27.1%). Several participants reported refraining from assessment once instruction moved online.

### Online learning platforms and technology tools

The course management systems or platforms used by the participants included Google Classroom ( $n=72$ , 67.3%), Seesaw ( $n=15$ , 14%), Microsoft Teams ( $n=15$ , 14%),

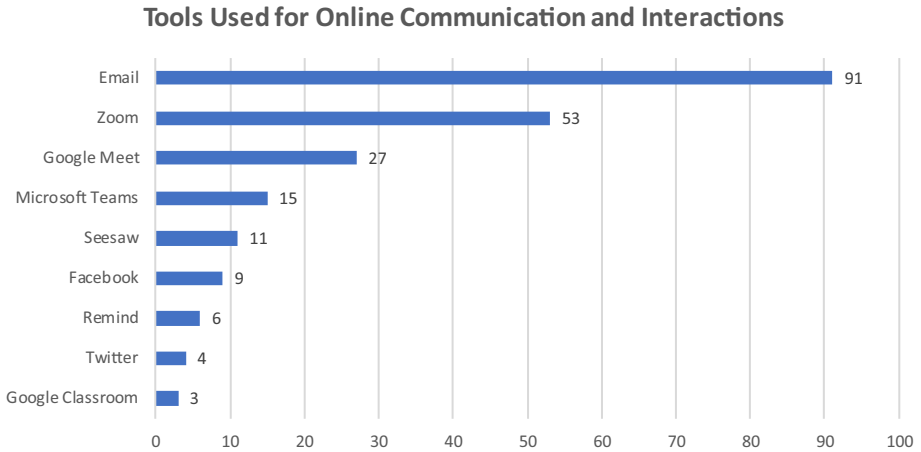
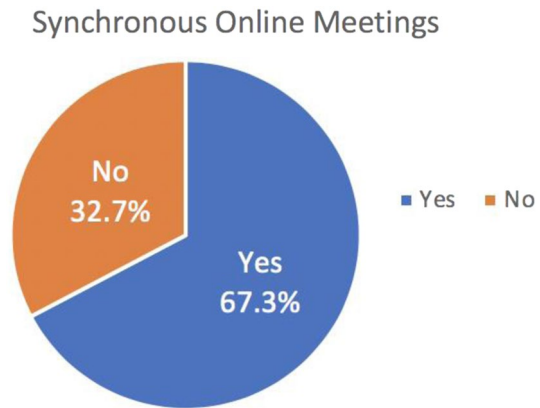


Fig. 3 Tools used for online communication and interactions

Fig. 4 Synchronous online meetings with students



PowerSchool ( $n=11$ , 10.3%), Canvas ( $n=8$ , 7.5%), Blackboard ( $n=5$ , 4.7%), Schoology ( $n=4$ , 3.7%), and Moodle ( $n=1$ , 0.9%).

To facilitate students' learning online, the participants used videos ( $n=91$ , 85%), Google Doc ( $n=75$ , 70.1%), Google Slides ( $n=67$ , 62.6%), formative assessment tools, such as Google Forms, Kahoot!, Quizlet, and Quizizz ( $n=63$ , 58.9%), reading and literacy tools, including Epic! and Reading A-Z ( $n=40$ , 37.4%), digital games ( $n=39$ , 36.4%), virtual field trips ( $n=39$ , 36.4%), Google Sheets ( $n=34$ , 31.8%), digital practice program ( $n=30$ , 28%), student creation tools (Book Creator, Adobe Spark, Canva, iMovie, etc.) ( $n=24$ , 22.4%), student research tools (databases, PebbleGo, etc.) ( $n=23$ , 21.5%), Seesaw ( $n=15$ , 14%), virtual reality apps ( $n=3$ , 2.8%), and augmented reality apps ( $n=3$ , 2.8%).

### Online communication and meetings

A select-all-that-apply item was used to examine the tools used for online communication and interaction. To communicate and interact with their students online, the participants

used a variety of tools, including email ( $n=91$ , 85%), Zoom ( $n=53$ , 49.5%), Google Meet ( $n=27$ , 25.2%), Microsoft Teams ( $n=15$ , 14%), Seesaw ( $n=11$ , 10.3%), Facebook ( $n=9$ , 8.4%), Remind ( $n=6$ , 5.6%), Twitter ( $n=4$ , 3.7%), and Google Classroom ( $n=3$ , 2.8%) (see Fig. 3).

Approximately two-thirds of the participants (67.3%) had synchronous meetings with their students (see Fig. 4). More than half of them (54.5%) reported meeting with students synchronously 1–2 times per week. About 9% had synchronous meetings 3–4 times per week. Another 9% had a synchronous meeting every day. In terms of duration of the synchronous meetings, 56.6% reported having meetings that were 30–60 min long. About 40% appeared to have shorter meetings (up to 30 min). Only 2.6% reported having meetings that lasted over an hour. Zoom (43.6%), Google Meet (25.6%), and Microsoft Teams (15.4%) appeared to be the most frequently used tools for synchronous meetings.

### Grade-level differences

A further analysis of instructional strategies and tools for online teaching revealed a few grade-level differences. One of the major differences between grades P-5 ( $n=41$ ) and grades 6–12 ( $n=66$ ) groups was the use of project-based learning. Project-based learning appeared to be more commonly used by middle and high school teachers than elementary school teachers. Approximately half of the grades 6–8 teachers ( $n=30$ , 45.5%) reported using project-based learning, while only 29.3% of the grades P-5 teachers ( $n=12$ ) used project-based learning. Another difference was found in the software used for online learning activities. For example, qualitative data analysis showed that many elementary school teachers were using *Seesaw* for online activities. On the other hand, grades 6–12 teachers appeared to use such software as *EdPuzzle*, *NearPod*, online quiz tools (e.g., *Quizlet*, *Quizizz*), and social media (e.g., *Facebook*, *Twitter*, *Instagram*). Such software as *Google Docs*, *Google Slides*, and *Flipgrid* appeared to be commonly used across different grade levels.

### Research question 3: What are the major challenges faced by teachers during the COVID-19 pandemic?

A number of themes related to the challenges faced by teachers during the COVID-19 pandemic were identified. Major challenges included: (1) lack of student participation and engagement (or lack of parental support), (2) students without access to technology, (3) concerns about students' well-being, (4) no face-to-face interactions with students, (5) no work-life balance, and (6) learning new technology.

#### Lack of student participation and engagement (or lack of parental support)

A number of participants reported that some students were not participating in online learning. A lack of student engagement was also often mentioned by participants. They believed that students did not participate in online classes partially because they were not required, as the following quotes indicate.

Students are not participating in the online learning, so it is very difficult to gauge whether it is successful. I understand and agree with the rationale for making it voluntary this quarter but it has limited student willingness to participate.

My district is not allowing us to require anything from students so getting students to actually engage and do work is difficult. And then getting them to actually turn in work is another hurdle. I do have some who are doing the work and turning it in.

It appeared that some younger students could not attend online classes or meetings because they did not have parental support. One elementary teacher stated that some students "have no support and don't attend daily sessions or do any work." Another noted that:

The gap between the haves and the have nots is greatly visible. Students who are not supported at home are clearly visible. Parents with education levels that are very low are struggling with helping their children. Frustrated parents are attacking us for their kids' inability to function in this environment.

### **Students without access to technology (digital divide)**

Participants reported that many students did not have access to the Internet and/or technology devices needed for online learning. Some school districts provided devices such as cell phones and Google Chromebooks to students as shown in the following quote, but others did not have sufficient resources.

Logistically, the primary issues that we dealt with when starting online learning was making sure that everyone had internet access, which we have done through providing cell phones as hotspots (fairly recently). Prior to this, students who did not have internet access were provided with printouts that matched what was expected online, but it still excluded our non-access students from the online check-ins or interactive pieces.

### **Concerns about students' well-being and learning**

Pointing out that many students are in unsupportive, unhealthy, unstable, or even dangerous home environments, the participants expressed their concerns about their students' safety and physical, mental, and social well-being, as shown in the following quotes.

My concern is their safety and mental health during this time. I have had many of them say in my check-ins that they have no one to talk to about their feelings and stress. I am also concerned about the students who are not logging in and who I can't get in contact with.

Another challenge that was an immediate priority when we started was making sure that students were still able to be provided with breakfast and lunch. We kept our food service staff and school bus drivers working by having them run routes daily to provide meals on wheels of sorts.

Parents have lost jobs, their phone/internet is being turned off or is bad, they have to work to support family, and help their multiple siblings complete assignments on one old computer because their parents can't help.

As these quotes indicate, participants were observing "an ever-widening divide between the students who have and those who do not." The participants were also concerned about students' learning as well as their well-being and expressed academic concerns. For example, a first-grade teacher mentioned, "when a child spends a long period of time away from school, it is common to see regression in their reading skills." Another teacher stated, "I'm

concerned that students are going to have HUGE gaps when moving on to the next grade level.”

### **No face-to-face interactions with students**

Another major challenge the participants faced was not being able to see and interact with their students face-to-face. Many participants were worried about their students and missed connecting with them. One participant mentioned during an interview that the most challenging aspect of online teaching was “inability to really read each other.” Another participant mentioned that “being online with them does not feel like being there for them.” A participant reported that online teaching “removed the most rewarding part of the job—connecting with students.” Overall, the participants felt that online check-ins and meetings did not replace the daily face-to-face interactions they had with their students.

The survey and interview results revealed that teachers in some school districts were not allowed to have synchronous online meetings with their students. For example, a participant stated, “we’ve also not been allowed to use any video conferencing tools such as Zoom or Google Meet.” As a result, some teachers had no idea how their students were doing.

### **No work-life balance**

Participants reported that they had no work-life balance with heavy workload and other added responsibilities, as shown in the following quotes.

I work from 9 am until 1 am the next morning with short breaks between to do the things a working mother has to do... Expectations such as the following: to document in logs what we do daily, contact students/parents/counselors for every missing assignment, meetings with co-workers and technology people and faculty, grading the work that is all over the internet in different digital sources and not organized in any fashion, constructing new lessons and activities, meeting with students every hour from 9–11 to 1–3 daily, putting grades in Infinite Campus, posting daily announcements to students, sending follow-up emails to each email received daily (usually 50–100 on any given day), etc... Then, I have a 5th grader and 7th grader of my own, three pets and my spouse working from home...

### **Learning new technology**

Another major challenge the participants faced during COVID-19 was dealing with new technology required for online teaching. They had to learn to use new tools and also provide technical support to students. The following quote shows a teacher’s frustration with an online learning platform.

I can’t do much to help students in Edgenuity. The school forced us to use it even though I already had my classes used to Google classroom. I’m frustrated because Edgenuity doesn’t work well and I don’t have the ability to help students with it. I also have no control what the students are learning or how they are learning it. I’m really just there to put in grades.

Other challenges reported included a lack of clarity and timeliness of decisions from a district level, constant changes, a lack of institutional support, assessing student learning,

grading online, time management, and spending a great deal of time sitting in front of a computer screen.

#### **Research question 4: What should be done to better prepare teachers for future emergencies?**

Four major themes were identified regarding how to better prepare teachers for future emergencies: (1) professional development for online learning, (2) technology access, (3) technology training for both teachers and students, and (4) action plans and communication.

#### **Professional development for online learning**

Participants reported that more professional development trainings should be offered for online teaching and blended learning so that they could “switch over to online learning” if they need to and provide “engaging and meaningful” learning experiences online. More specifically, participants wanted to learn research-based strategies or best practices for teaching online. A participant mentioned during an interview that “what does the research say about the hallmarks of good online instruction?... How do you develop engagement in online instruction? That is really at the forefront of my mind.” Another participant argued that “mandatory training and preparation for the fall semester courses needs to be implemented.” As the following quote indicates, the need for an instructional technology department was also addressed.

Every district (big or small) should have an instructional technology department that works in conjunction with the curriculum department to provide access to various online resources, provide professional development in the area of best practices and tech integration, and be able to support their teachers in times of emergencies.

#### **Technology access**

The results revealed the digital and technology resource divide. While some participants were given all kinds of technology resources, others were struggling with old devices. For example, one participant reported that “a BIG challenge has been using an older, personal device for all participation in anything that requires more than typing.” He believed that schools should “provide all teaching staff with devices that have cameras and microphones.” As reported in the previous section regarding major challenges, many students did not have access to the Internet and technology devices needed for online learning. Participants emphasized that all students should have “equitable access to reliable devices and WiFi.”

#### **Technology preparation for both teachers and students**

In addition to technology access, the participants believed that technology preparation for both teachers and students are necessary to be better prepared for future emergencies. They reported that both teachers and students should know how to use online platforms and other technology tools that might be used in online learning, as indicated in the following quote.

Educators have been resilient in bouncing back in rallying together in providing amazing resources; but for future reference we must enforce A LOT more technol-

ogy-based skills. Students should be required to sign in with their school emails and communicate solely with them. Teachers should be trained on knowing what to do when students are locked out of the system and how to reset. Teachers should understand how to create online classrooms and notebooks for assessment. Students must understand how to submit required documents online and adhere to strict deadlines.

Several participants suggested doing daily things via technology so that they could be better prepared for technology use in emergency situations. For example, a participant stated, “if we would have been using zoom for meetings instead of going to the library, we would have known that tool. I hope the world doesn’t “make” us start attending technology training because it needs to be part of your daily/weekly/monthly life.”

### **Action plans and communication**

As the following quote indicates, participants believed that every school district should create action plans for future emergencies that require online teaching.

I think every school district/campus should have an action plan in place for possible emergencies that require us to teach remotely. The struggle with this situation is that no one expected anything like this to happen, so there wasn’t a plan in place to help everyone navigate this.

Participants from some southern states reported that they did not have any plan in place and wasted several weeks trying to decide what to do. They assumed that “schools in areas with lots of snow days or hurricanes have emergency plans” and felt that they needed to follow their lead. Along with action plans for future emergencies or pandemics, the participants emphasized the importance of clear and timely communication. For example, one participant stated, schools should “create plans for the what ifs and SHARE them with staff so if a situation arises, everyone knows what to do!” Another participant mentioned that “a cohesive set of expectations from the state and district levels as to when we might be out and what we are expected to do on a daily and weekly basis for our students” should be communicated.

### **Research question 5: What are teachers’ perspectives of the “new normal” after COVID-19?**

Regarding teachers’ perspectives of the “new normal”, five major themes emerged: (1) more online or blended learning, (2) rethinking normal, (3) hygiene and social distancing, (4) smaller classes and different school schedules, and (5) uncertainty and concerns about the “new normal”.

#### **More online or blended learning**

Participants believed that many teachers would incorporate technology into daily instruction and use more online or blended learning in case shelter in place happens in the future. For example, an elementary school teacher stated, “I think many teachers will use Google Classroom from the beginning, so that it will be available during school closings (weather or health).” Another participant mentioned, “I believe we will not return to a brick and



mortar setting. I think that all districts will develop and have in place plans (if not actively using) for distance or online learning environments.”

### **Rethinking normal**

The results revealed that some students were “thriving,” while other students were “struggling” in online learning environments during COVID-19. Participants noted that students can be “motivated,” “autonomous,” and engage in “real world learning” in online environments, as shown in the following quotes.

I have seen some of my students thriving in the home-schooling environment and they are a totally different child through e-learning. I would say that online learning has been beneficial for students that struggle with confidence in a classroom environment and interacting with others in a large group setting. I would also argue that online learning has provided students with more opportunities to have "real world" learning experiences that they would not have been given in a classroom setting. Honestly, I am inspired and hopeful that this time of remote learning will allow others to see that students can be autonomous and that by providing choice they are motivated to learn. So the challenge I am facing is when others don't see this as an opportunity, but rather as something we HAVE to do for a short time, and then we will get back to 'normal'. I cannot do the normal that doesn't help kids anymore.

Those who had positive experience with online learning expressed concerns about going back to normal. For example, a participant stated, “I worried everyone would rush to ‘return to normal’ when, in fact, there are some students thriving online.”

### **Hygiene and social distancing**

Participants believed that schools would be more cautious about hygiene and social distancing. Specific ideas regarding this theme included “hand-washing,” “sanitizing classrooms,” “social distancing requirements,” “a heightened level of protocols for germ-prevention,” “one-way hallways,” no groups or assemblies,” and “masks for everyone.” Participants also thought that schools would revise a health code of conduct with increased restrictions, as shown in the following quote.

I think that schools will be much more cautious about student hygiene first and foremost. I think we will see a revised health code of conduct with increased restrictions on when students are permitted to come to school with specific health ailments.

### **Smaller classes and different school schedules**

Participants thought that all students would not be in the school at the same time during and after COVID-19. They believed that schools would have to have smaller classes and different school schedules so that they could practice social distancing. Regarding school schedules, participants had various ideas, including “half attend one day, while the rest are online,” “different days for different grades,” “different mornings then afternoons that students will attend,” “only meeting with students face to face 1 time per week and the rest online,” and “classes being taught early morning, later in the afternoon and at night.”

## Uncertainty and concerns about the “new normal”

While many participants shared their perspectives of the “new normal” after COVID-19, a considerable number of participants stated that they were uncertain about the “new normal.” They thought that schools would be different, but they were not sure what the “new normal” would look like. For example, one participant stated, “I have no idea what the “new normal” will look like. I have had as many as 42 students in my room for my chemistry class. Social distancing would be absolutely impossible.” Another participant explained why she had no idea by asking many unanswered questions.

I have no idea. Just yesterday we talked about how cafeteria times will have to be doubled to space them and we'd have to use the gym too and all this other stuff, but then the question begs how do we keep them apart in the hallway? Do I teach in a mask now? What desks are they to use? K-8 students mostly can have their own desks for the day—9-12 how does that schedule work-teachers WOULD rotate, but how do we align kids' schedules?! They're SO diversified!

Several participants reported that they were “sad” and “nervous” about the future and that thinking about the “new normal” scared them. A participant stated that she did not even want to think about the “new normal.” Some other ideas about the “new normal” included flipped learning and family involvement. A few participants believed that there would be “more flipped learning” and more family involvement after COVID-19.

## Discussion

The researchers collected the survey and interview data between late April and mid-June of 2020 to capture K-12 teachers' feelings, online teaching strategies, concerns, challenges, and perspectives during the early stage of the COVID-19 pandemic. Despite the abrupt shift to online learning, the majority of the participants (80%) in this study believed that they had knowledge and skills for online teaching, and nearly 70% felt confident with online teaching. These findings suggest that many K-12 teachers in the US had a high-level of self-efficacy and were able to switch to online learning within the short time frame. The literature reveals different views of teachers in other countries. For example, Mailizar et al. (2020) found that a lack of teachers' knowledge and skills and a lack of confidence were top barriers to implementing e-learning in Indonesia during the COVID-19 pandemic. Although most participants in our study were confident with online teaching, only 19% preferred online teaching to classroom teaching. Many participants were concerned about their students and missed them. Connecting with students appeared to be the most rewarding part of the job to some teachers.

In terms of online teaching strategy, 45% selected “learner-centered,” and another 45% selected “mix of teacher-centered and learner-centered” as a teaching approach that best described their online teaching. Interestingly only 10% appeared to use teacher-centered approaches (e.g., lectures and exams). Along with video lectures (65.4%) and reading materials (65.4%), the participants used a variety of learner-centered instructional strategies, such as online discussions (47.7%), learning by making (43%), project-based learning (40.2%), and hands-on activities (36.4%). They also used various technology tools to facilitate their students' online learning. Email (85%) was the most

commonly used tool for online communication with students. About 67% had synchronous online meetings with their students using Zoom (43.6%), Google Meet (25.6%), Microsoft Teams (15.4%), or a similar video conferencing tool. The results revealed that teachers in some school districts were not allowed to have synchronous meetings with students or require anything from students during the spring semester. As the pandemic continues, it would be interesting to see how teachers change their online class structure and their teaching strategies over time.

The results of this study shed light on the challenges teachers faced during the early stage of the COVID-19 pandemic and provided practical insights into how to better prepare teachers for future emergencies. One of the major challenges faced by teachers during the spring semester was a lack of student participation and engagement (or lack of parental support). This finding is in line with the recent study conducted by Clausen and his colleagues (Clausen et al., 2020). To gain a better understanding of why students were not completing their eLearning work, Clausen et al. (2020) surveyed 44 teachers (grades 7–12) and found that many parents/guardians were unaware of assignments, how to check for them, or when they were due. The study suggested that more professional development (PD) was needed to help teachers better communicate with families. Although it is critical to provide teacher training in communication tools to improve communication with families (Clausen et al., 2020; Olmstead, 2013), more is needed to address the disparity in online access, which has been called the “homework gap” (Clausen et al., 2020).

The COVID-19 pandemic has shone a spotlight on digital divide issues, including the homework gap. The results of this study revealed that many students lacked access to the Internet and technology devices needed for online learning. This finding is not surprising because digital divide has been a concern since the beginning of the digital age (van Dijk, 2006). Other recent studies reported that numerous students are not accessing online materials (Hall et al., 2020; Pew Research Center, 2020). Research also shows that a lack of access to computers and wireless internet access negatively impacts communities of color, rural communities, and those in lower socio-economic groups (Anderson & Perrin, 2018). With the help from private businesses and organizations, school districts have tried to bridge the digital divide by providing devices and wireless internet access to those in need (Ali & Herrera, 2020). Prompt actions from educators allowed for relevant adaptations and accommodations during COVID-19 (for example, Brewer & Cartagena, 2020; Ferdig et al., 2020; Smith & Colton, 2020). These efforts should continue, and further research studies should be conducted to explore effective ways to address the homework gap and digital divide issues.

The results indicated that professional development for online learning would be necessary to better prepare K-12 teachers for future emergencies. The quantitative findings showed that 66% of the participants wanted to learn more about online teaching. The qualitative findings also confirmed that many teachers wanted more professional development training for online learning. The results also showed that some teachers lacked adequate devices and tools for online teaching, while others received all technology devices and trainings from their schools or school districts. Since different school districts and different teachers have different needs, it is apparent that the “one size fits all” approach will not work. Therefore, it is important to understand teachers’ local contexts and provide relevant and customized PD training (An & Reigeluth, 2011; Philipson et al., 2019). Further, it is very important to provide ongoing support outside the formal PD especially in these uncertain and unprecedented times. As Philipson et al. (2019) suggested, PD programs should provide a supportive environment with regular and just-in-time support and feedback. Building communities of practice and/or using

peer support can be effective and efficient ways to support teachers' learning and professional development (Orrill, 2001; Ertmer, 2005; Kopcha, 2010; Philipson et al., 2019).

Regarding the "new normal" after COVID-19, several participants were unsure or concerned about it, and others shared some specific ideas related to online or blended learning, hygiene and social distancing, smaller classes, and different schedules. One of the most interesting findings was that some teachers were concerned about going back to normal. They observed that students were motivated, autonomous, and engaged in real-world learning in online environments. They also noted that some students were "thriving" in online environments. In a similar vein, Ferdig et al. (2021) identified several positive educational outcomes of the pandemic. One of the positive outcomes was the shift to technology-enabled learning. The spring 2020 emergency remote learning transition served as an opportunity to get all teachers to explore the use of technology for teaching and learning. Many teachers recognized new possibilities and new ways to teach through the transition. These findings suggest rethinking normal and taking advantage of online and blended learning to improve students' learning and meet their different needs.

## Limitations and future research

Several limitations exist in this study. First, the participants of this study were limited to 107 teachers from 25 states in the US. Although the study attempted to capture the teachers' online teaching experiences during the COVID-19 pandemic in as many states as possible, the sample size was small. However, the comparison between the demographic data of our sample and those from NCES showed that our sample was representative of the overall population of teachers in the US. Also, qualitative findings from interviews corroborate the survey findings. It is worth noting that our sample over-represented females and secondary school teachers. To examine the potential bias of our sample characteristics, we recomputed selected survey response statistics using weighted averages, with weights given by the reported NCES statistics for gender and grade-level. Although most of the reweighted survey responses showed no meaningful difference, some responses changed slightly. For example, reweighting the responses to survey question, "I have knowledge and skills for online teaching," by the proportion of males in the NCES statistics slightly increased the average response for question #1 from 4.07 to 4.14. Future research should use a larger sample and consider comparing findings from different countries.

Second, this study focused on the perspectives and experiences of K-12 teachers. Future research may involve all stakeholders, including students, parents, and administrators, to develop a more comprehensive understanding of what is going on in new learning environments and develop better actions plans that address all stakeholders' concerns and opinions.

Finally, the study was conducted in the early stage of the COVID-19 pandemic. While it was important to capture teachers' feelings, experiences, and perspectives in the spring semester of 2020, analyzing data from later stages of the pandemic could shed a different light on the dynamics of teachers' experiences with online teaching.

## Conclusions

This study aimed to fill the gap in the literature on K-12 teachers' online teaching experiences during the COVID-19 pandemic. By exploring K-12 teachers' feelings, experiences, and perspectives regarding online teaching during the early stage of the COVID-19 pandemic, this study offers a better understanding of teachers' feelings about online teaching, their online teaching approaches and strategies, challenges they faced, and their perspectives of the "new normal" after COVID-19, and what should be done to better prepare teachers for future emergencies. Further, it provides practical insights and recommendations into what to consider when developing teacher professional development and action plans for future emergencies.

## Declarations

**Conflict of interest** The authors declares that they have no conflict of interest to disclose.

**Informed consent** The informed consent notice approved by UNT's IRB was provided on the first page of the online survey. The survey participants were asked to click the Next button and complete the survey if they agree to take part in the research.

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