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Article

Impacts of K-12 emergency online teaching within a rural, rural-remote context: Finding value in the experience

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Abstract

Exploratory, convergent mixed methods research was used to examine the shifts in rural/rural-remote K-12 teachers' (n=40) perspectives and experiences of emergency online teaching (EOT), including perceptions of value before and after the EOT phase of the recent COVID-19 pandemic. The sample came from one highly rural state (64.9% rural population) in the western United States. Data were collected using a Likert-like survey along with a set of open-ended questions. Descriptive statistics and a t-test were used to examine survey data while thematic analysis of the participants' narratives was used to identify themes within the open-ended data. A substantial increase in knowledge was reported post-EOT, and statistical analysis confirmed significant gains in perceived knowledge of and confidence with online instruction ($t(39) = 8.2041$, $p \leq 0.001$) within the sample. Findings suggest that participants' self-efficacy with online teaching improved because of their EOT experiences. Results also suggest the experience had value beyond the pandemic years, with participants reporting perceptions of slight to moderate value, including ongoing value for enhancing teaching and value for learning along with perceptions of self-efficacy and adaptability in times of future crisis. Within the qualitative data, both prominent challenges, such as student engagement, and successes, such as teacher adaptability and resilience, emerged. Recommendations along with consideration of the implications for teacher educators, rural policy makers, and other stakeholders interested in determining the long-term benefits and challenges of the emergency online teaching experience on teachers and their professional practice are examined as well.

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Introduction

Research regarding teachers' perspectives of the era of emergency online teaching (EOT) is vital to our reflection on and understanding of the successes and challenges for learning that occurred during the COVID-19 pandemic. Early on, terms such as emergency online teaching (EOT) and emergency remote teaching came into common use and were used to frame teachers' understanding of the rapid shift from face-to-face learning to online, blended, or remote teaching. EOT will be used here to describe the specific type of online teaching that emerged across many K-12 classrooms during the pandemic. EOT and traditional online

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teaching are not the same and, therefore, cannot be considered interchangeable terms or phenomenon. Rather, Hodges et al. (2020) described it as a means for "temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis" (¶ 13). Further, EOT differs from traditional online teaching in several key aspects. First, EOT began rapidly with little to no opportunity for planning. In contrast, online instruction is often planned weeks or months in advance. Second, teachers, parents, and students came into EOT with a mindset that it would be temporary. This sense of impermanence resulted in limited efforts on the part of teachers, schools, and districts to formally prepare students and teachers for online instruction, including teacher professional development opportunities. Establishing formalized communication channels between and among stakeholders, including between teachers and parents, was not common. Also, efforts to consider how to personalize learning were not often considered (Azizi et al., 2023; Ray, 2023). As such, this study seeks to add to the emerging literature on EOT by examining the shifts in rural/rural-remote K-12 teachers' perspectives and experiences of EOT, including perceptions of value before and after the EOT phase of the recent COVID-19 pandemic. Understanding the perspectives of rural/rural-remote teachers is critical for fully understanding not just the challenges faced in the moment, but for mitigating the possible long term negative impacts that can directly influence K-12 students' future academic success. It also assists policy makers to make evidence-based decisions about the issues that impact rural/rural-remote learners (Hurtt et al., 2025).

Theoretical Framework

Because only a limited amount of research has been published documenting rural/rural-remote K-12 teachers' experiences during the EOT era, grounding this study in aspects of the theoretical Technological Pedagogical Content Knowledge (TPACK) framework is useful. TPACK describes the types of knowledge teachers need to successfully integrate technology into their teaching practice. Specifically, it functions as a conceptual tool to identify what teachers need to know and be able to do to assure the successful intersections of technology, pedagogy, and content (Mishra & Koehler, 2006; Pamuk, 2012). In terms of teaching, TPACK suggests that technology impacts what we teach and how we teach (L. M. Archambault & Barnett, 2010). WTPACK expands this knowledge base to include online teaching, allowing for the use of internet-based tools, communication, and interaction (Lee & Tsai, 2010; Schmid et al., 2024) with the intent of promoting "active student engagement, in-class communication, and technology…skills" (Kocagül & Çoban, 2024, p. 149), These types of usage highlight the connection between online teaching and TPACK (L. Archambault & Crippen, 2009; Kocagül & Çoban, 2024).

Literature Review

Specific issues associated with rural and remote settings complicated the transition to online teaching and learning early in the pandemic. As Chaudhuri (2022) reported, many teachers had to overcome challenges such as "a lack of access, lack of resources, lack of infrastructure, unavailability of devices, and a lack of qualified teachers" (p. 55) who knew how to teach online (Wang et al., 2024). Beyond the rural context, most K-12 teachers had to adjust their instructional strategies and pedagogies (Abbasnejad et al., 2024; Wharton-Beck et al., 2024), but rural and remote teachers may have had to adjust even more given research suggesting

that these teachers tend to rely on technology drill and practice more than urban and suburban teachers. (Kormos, 2018). Further, most rural and remote schools' use of technology is hampered by slow internet speeds which limit access to and use of instructional video, audio, and other downloadable course materials (Marshall et al., 2024). Beyond specific rural concerns, several universal concerns emerged and are explored in the following sections.

Social-Emotional Concerns

In terms of social challenges, many teachers cited concerns regarding a lack of in person, social interactions with and among students, peers, and parents. Issues associated with teaching from home, including obligations to their own children and family members, emerged as did concerns about parental support, particularly regarding parents working from home during the school day (Ferri et al., 2020; Marshall et al., 2024; Misirli & Ergulec, 2021). Trust and Whalen (2020) reported that many "felt overwhelmed and unprepared" (p. 191), particularly in terms of making decisions about online or remote teaching strategies and tools. According to Procentese et al., (2023), these issues contributed to increased levels of stress among teachers, "putting their job-related efficacy and satisfaction at risk" (p. 67). Similarly, Jeffery and Bauer (2020) reported issues among students suffering from the loss of in person, peer interaction and networking. Additionally, concerns about teachers and students' feelings of frustration and/or isolation were not considered (Rippé et al., 2021; Yang et al., 2024) during the move to EOT. Furthermore, motivation emerged as a major challenge for learning (Lima et al., 2023) as did the lack of teachers' experiences with and training on online instruction (Barbour & Hodges, 2024; Ferri et al., 2020).

Technological Concerns

Prior to the start of the global pandemic, Trust and Whalen (2020) report that a majority of teachers had no experience with remote, online, or blended teaching, but nearly one-third of the participants in their study had "some experience with remote or online teaching and nearly one-half of the participants had some experience with blended teaching" (p. 191), suggesting that some limited expertise did exist within the K-12 teaching population. Despite the vast reservoir of online expertise that exists beyond any individual classroom, most teachers in the U.S. worked in isolation while locating and learning how to use these tools, as well as when planning online instruction using these tools (Regalado, 2025). Feelings of chaos and uncertainty, with many K-12 teachers making instructional decisions based on what was available, or known to them, rather than what was known to be an effective online teaching tool (Johnson et al., 2023) resulted. Further, decisions about whether to go with synchronous or asynchronous learning design and delivery were often made at the district level (De Voto & Superfine, 2023). Oftentimes, these decisions did not prioritize the needs of learners (Ott, 2024), either collectively or individually.

Technological challenges include reliable Internet access, particularly in rural areas, and socio-economic concerns resulting in many students lacking home access to tablets, laptops and other computers (Gómez-Domínguez et al., 2024; Schuck & Lambert, 2020). Further, a lack of digital skills among many teachers also hampered instruction and learning early in the pandemic and while a multitude of ideas were shared among teachers online using social media (Donahue, 2023; Macias, 2023; Ray, 2023), many teachers reported a lack of access to quality, structured online content (Ferri et al., 2020). Further, Whittle et al. (2020) reported concerns among teachers regarding unplanned circumstances, such as interrupted Wi-Fi or

frozen software, that teachers needed to respond live, in the moment. Interruptions such as these resulted in a need for instructional flexibility among teachers, students, and parents (Ray & Ntuli, 2022).

Pedagogical Concerns

Pedagogical challenges as reported by several researchers and involved teachers not knowing how best to support online or remote learning. Jeffery and Bauer (2020) reported a shift from active engagement and hands-on learning, particularly in laboratory settings, to one of passive viewing online. Likewise, Peters et al. (2025) reported "substantial unfinished learning" (p. 25), particularly among those in rural and high poverty areas. Ray's 2023 study of teachers' social media use in the early weeks of the pandemic suggests that teachers were worried early on about this possibility along with possible impacts on learning (Chiu, 2021; Ingram, 2024). Many teachers needed substantial support shifting from face to face to remote, or online, teaching with many relying heavily on informal, self-directed learning strategies (Trust & Whalen, 2020). Professional learning networks, including digital networks such as Twitter (Macias, 2023; Ray, 2023), provided the bulk of documented assistance (Trust & Whalen, 2020). However, use of data driven decision making declined except in terms of optimizing students' access to technology (Botvin et al., 2023). Further, curricular needs, including consideration of how best to meet state standards and the nature of the content of courses, were not meaningfully considered during the initial shift to online instruction. There also was not any serious consideration of the cognitive or skill-based needs of specific courses, such as STEM discipline course (Azizi et al., 2023).

Despite the concerns outlined here, some researchers have suggested that not only did positive innovations occur during the EOT era, but that those innovations can play a role in improving instruction (e.g., Bonk et al., 2020; Testa et al., 2023). Yet, Uncertainty remains as to whether the quality of K-12 instruction occurring during the EOT area was acceptable (e.g., Peters et al., 2025). Due to this uncertainty, research documenting early versions of what constituted EOT is important as are efforts to document its efficacy for learning (Radloff et al., 2024).

Study Purpose

Given its emergent status as a field of academic inquiry, research on EOT is vital to our reflection on and understanding of the successes and challenges for learning that occurred during the recent COVID-19 pandemic. Understanding K-12 teachers' perspectives on the impacts on teaching and learning is critical to identifying and mitigating any potential long term negative impacts that can directly influence K-12 students' future academic success. It is also useful in terms of assisting educators, including those who train them, to prepare for future challenges, such as teaching in times of human or natural disaster (Ray & Hocutt, 2016), including future pandemics (Low, 2024). At present, there is not enough research on the efficacy of K-12 EOT, particularly studies focused on rural K-12 environments. We also do not know how well technology, including online learning platforms (e.g. Google Classroom) and communication software (e.g., Zoom) supported teachers and learners. As a result, the primary goal for the study is to conduct research into these issues to better inform educators, instructional technologists, policy makers, and others interested in rural challenges and rural education.

Method

The study used an exploratory, convergent mixed methods approach to query rural state K-12 teachers' perceptions of, and experiences with, emergency online teaching. Data examined comes from a larger, national study of K-12 teachers' perspectives on EOT. IRB approval was obtained in advance of data collection.

Sampling and Participant Demographics

One geographically removed and culturally diverse rural western U.S. states was purposively selected. The selected state had a population well under one million and fits within the rural state definition parameters established by the U.S. Bureau of the Census (n.d.), with a rural population of 64.9%. Culturally, the state also demonstrates some diversity via its varied indigenous populations and its cowboy/ranching traditions. Participants were purposely delimited to practicing K-12 teachers (n=40) teaching in rural and rural-remote public schools during the early pandemic era. Seventy-five percent were female and 22.5% were male, with one electing not to provide gender information. Slightly more than eighty-seven percent taught in rural (35) public schools, with five teaching in rural-remote settings. All taught within one of the most rural states in the United States. Participants included elementary (37.5%), middle (35%), and secondary (27.5%) level teachers. The majority (nearly 63%) had taught for 10 or more years. Further demographic data of a personal nature were not collected (i.e., name, school, and district information) to better ensure both confidentiality and anonymity. Invitations to participate in the research were sent via email to teachers with publicly available email addresses. The response rate was 23%. While responses remain of interest to those working with rural state teachers, quantitative results cannot be generalized to the population of rural/rural-remote teacher teaching in the selected state during the early stages of the pandemic. As such, qualitative data was collected to provide nuance for the quantitative results.

Instrument Development

A five-point Likert-based questionnaire was developed based on the existing research base. It used the following choices, not at all (0), slightly [positive] (1), moderately [positive] (2), very [positive] (3), and extremely [positive] (4). The questionnaire queried rural/rural-remote educators' perceptions of the value, importance, barriers, and supports associated with use of EOT to support K-12 teaching and learning during the pandemic era. It also queried teachers' perceptions of self-efficacy with EOT pre- and post-. The questionnaire was further designed to collect qualitative data via a set of open-ended questions.

Cronbach's Alpha was used to determine the internal reliability of the questionnaire's survey items. The value for Cronbach's Alpha was $\alpha = .938$, indicating an excellent level of internal consistency. Content validity was established by aligning questions to themes identified in the literature review. Further, expert validity was used to confirm that alignment and to identify additional questions. At each step, the questionnaire was modified to reflect both expert review and pilot test feedback. The use of the open-ended questions served to support triangulation as did the use of more than one data reviewer.

Data Analysis

Thematic analysis was used to examine the qualitative data collected via the open-ended questions. This approach was selected "to identify themes, i.e. patterns in the data that are important or interesting and use these themes to address the research or say something about an issue" (Braun & Clarke, 2006, p. 84) a flexible, accessible method of analyzing the reflective responses provided via the open-ended questions. Further, this approach allows both surface meaning of what is written and a deeper examination of "underlying ideas, assumptions, and ideologies" that are "shaping or informing" what was written. (Braun & Clarke, 2006, p. 84). Via this approach, the study sought to understand respond' experiences of EOT. Quantitative results in the form of a dependent sample two-tailed *t-test* of self-perspectives of efficacy pre and post EOT are shared along with other descriptive statistics, including means, frequencies, and standard deviations. The goal was to examine and understand EOT from the perspectives of a group of teachers who had not yet been asked to voice their experiences.

Findings

This study used an exploratory, convergent mixed methods approach to query rural and rural-remote K-12 teachers' perceptions of, and experiences with, emergency online teaching before and after the EOT phase of the recent COVID-19 pandemic. Quantitative and quantitative findings are shared along with a discussion of the study's limitations.

Pre-EOT Knowledge Perspectives

When asked to consider their online teaching knowledge in advance of the pandemic's start, 21 (52.5%) participants reported "no knowledge" while 18 (45%) reported "some knowledge" about how to teach online or using blended learning strategies. One reported an extensive level of knowledge. The average was 0.5 (SD = 0.55), suggesting the majority either had no knowledge or had limited knowledge about online learning in advance of the pandemic.

Post-EOT Knowledge Perspectives

Considering knowledge gains post EOT, "no knowledge" dropped markedly to one, while "some knowledge" responses increased to 25 (62.5%) and "extensive knowledge" rose to 14 (35%) among participants. The average was 1.33 (SD = 0.53). A dependent sample 2-tailed *t-test* was conducted to compare perceptions of knowledge of online teaching pre- and post-EOT experience. Results indicate that the change in means was significant, ($t(39) = 8.2041$, $p \leq 0.001$). The majority perceived that their online teaching knowledge improved as a result of their EOT experiences.

Efficacy of EOT

Additional data regarding teachers' perspectives about the EOT experience were collected. Data are grouped into two categories identified by the researchers and based on the study's goals, 1) perceptions of value, 2) and perceptions of self-efficacy and motivation to engage in online teaching in the future (see Table 1).

Table 1. Survey indicators by category

Perceptions of Value	**Average**	**SD**
Value for learners	1.90	1.48
Value as a learning tool for the core academic knowledge	1.68	1.13
Value for academic skills-based learning	1.45	1.30
Value for dispositional learning	1.28	1.07
Value for student creativity	1.48	1.05
Value for collaborative learning	1.03	0.95
Value for problem-based learning	1.45	1.2
Perceptions of Teacher Self-Efficacy and Motivation		
How prepared are you to evaluate tools and materials for use in EOT?	2.2	1.01
To what extent are you motivated to engage in EOT in the future?	1.5	1.3

n=40

All indicators demonstrated positive responses, with eight occurring within the slightly positive range and one occurring within the moderately positive range. The ability to evaluate tools and materials for use when teaching online demonstrated the highest positive score, with perceptions of value for learning demonstrated the next highest positive scores on the instrument. Perceptions of value for collaborative learning demonstrated the lowest positive score. Motivation to teach again online landed within the slightly to the moderately positive range.

Qualitative Results

In addition to completing the survey, participants offered written reflections, outlining their perspectives. Within this qualitative data, both success and challenges emerged as major themes. Themes reported here may suggest why teachers' motivation to teach online was only slightly positive.

Challenges of EOT

All participants identified critical challenges that they faced during the EOT experience. In order of frequencies, the following challenges were reported: 1) student engagement and connection, 2) pedogeological issues, including individualized learning and the effective use of technology, and 3) connectivity issues, including technology and internet access, and staying in touch with and consistently reaching students. All participants shared written perspectives on challenges faced. Student engagement and maintaining connections with students were mentioned with greatest frequency. The following response from Emily, a secondary level teacher, is illustrative of this theme:

> Engaging the students. Students showing up to a zoom class. Keeping the attention of the students. Knowing or not knowing if the students were fully present. Some students would be on their phones, doing other things, being interrupted by siblings, parents, pets, or the environment was not quiet or supportive of study. Students would not put on their video so I could not make eye contact. T[heir] energy was low overall.

Allison, an elementary level educator, agreed, adding, "…I really started from 0 in terms of how to effectively teach…students remotely." Further, many reported concerns related to creating and accessing online materials for instructional use. Finally, communication and connection challenges appeared with some frequency. As Collin, a secondary educator, reported, "Kids not showing up or doing work and no way to reliably contact them result[ed] in learning gap[s]" that had to be addressed regularly. Communication with parents was also cited as problematic by a few. Further, some reported difficulties reading faces and emotions when teaching online with others reporting challenges managing the online learning environment.

Some teachers focused specifically on pedagogical issues associated when adapting to online and blended learning. For example, Emerson, an elementary teacher, wrote that "[m]aking sure I had both an online presence and a digital presence" was a time and planning challenge while Jordan, a middle school teacher, reported that "creating lessons that could be done independently and…deciding what was [the] most important [learning] to address" was challenging. Further, many wrote about technological and internet challenges. Specifically, a lack of knowledge about how to use online and other technologies such as Chromebooks, learning management systems (LMS) such as Google Classroom and/or Canvas, and video production software and apps were frequently cited.

With limited frequency, a few cited specific difficulties ensuring that students were getting the emotional and academic support they needed while learning online while others cited a perceived lack of consistent support from administrators along with issues of work life balance. Further, issues of timing, including starting class on time and getting students logged into online software, such as Zoom, Canvas, and Google Classroom, along with non-technical issues involved in getting students online and keeping them logged into synchronous course meetings were reported by a few teachers.

Successes of EOT

With less frequency, participants identified successes with EOT. While some participants did not share any benefits, those shared were substantial in terms of identifying EOT's potential efficacy in times of crisis. They included, 1) adaptation and resilience, 2) student engagement and connection, 3) exploration and use of new technologies, including the value for them in figuring out how to deal with software and connectivity issues, and 4) pedagogical successes. Many responses suggest an ability to persevere and adapt to a new teaching environment. For example, Charlotte, a middle school teacher, reflected: "I learned a lot about how to put together lessons online, from making and editing videos to hosting live sessions," and Taylor, another middle school teacher, wrote that "learning new skills that also transfer to an in person setting" was his greatest success. Further, Verity, a first-year teacher early in the pandemic, reported, "I did begin understanding the best way to help students virtually and learned about some new programs that I had never tried." And, finally, Charla wrote,

> My greatest success was learning how to set up a class online in a matter of days. I was able to produce and share video lessons, provide access to pdfs for work and create a format for the students to turn their work in where I could comment on the assignments directly.

Interestingly, student engagement was reported as both a challenge and as a success by many. Regarding successes, several teachers reported that being able to interact online with students reduced their sense of isolation during the pandemic. Jalen, a secondary teacher, reflected that "[s]tudents actually participating when they were aware that we could not lower their grades for not working" was a major success for him and Elliot, an elementary teacher, reflect that "[s]eeing the kids at home and being able to have some nice chat time at the beginning of class before the lessons, were pleasurable."

Additional successes were noted as well. For example, many responses suggested that technology played a significant role in the holistic experience, with a majority identifying technological benefits for learning. For example, Holly, a middle school teacher, reported, "I was able to grow my skills professionally. I learned new ways to reach and teach my students. There are things I did during our virtual class time that have carried over into my traditional classroom."

Further, pedagogical successes emerged within the responses, including opportunities to learn about online pedagogy and adapt traditional pedagogies, including, in order of frequency, individualized, creative, collaborative, problem-based, visual, outdoor, and inter-disciplinary learning strategies for online use. Illustrative of this theme, Ashley, another first-year elementary teacher during the EOT experience, provided the following perspective: "The greatest success was the creativity teaching online allowed me...I was a first-time teacher, trying to modify my curriculum to work online and that gave me a lot [of flexibility.]" Another more experienced elementary teacher, Amanda, reported, "I learned a lot about how to put together lessons online, from making and editing videos to hosting live sessions." Further, some reported that being forced to learn how to individualize plans and goals for students was, in fact, a major benefit for them coming out of the pandemic era. Finally, a few teachers reported being able to provide similar instructional activities as they did in face-to-face environments, particularly using recorded lectures, of value. A few also wrote about the benefits of learning new skills and programs that they continued to use when they returned to in-person, classroom-based learning. A few also talked about the value gained from students learning how to be self-motivated and enhanced opportunities for active parental involvement, including getting to know families better.

Limitations

Issues of geography and cultural diversity, along with issues associated with self-selection when using survey research, likely impact the study's generalizability. As such, normality may not exist. Likewise, issues associated with effect size may have led to minimal practical significance, even though the t-test indicated statistical significance. Whether or to what extent practical significance exists remains unknown. Many of these issues remain both possible and unknown given the small response rate (23%) and the focus here on one rural, rural-remote western state. Likewise, it may be that results for K-12 teachers with background knowledge about online learning or those who actively chose to teach online during the pandemic may have differed. As such, research employing a larger, normative sample size can allow for depth of consideration and the examination of more factors, such as urbanization, gender, age, and previous online experiences, any of which might alter the results reported here. Further, many teachers, particularly those practicing in small rural-remote schools, either did not have school-based email accounts or those email addresses were not publicly available for inclusion in the research inquiry. It is possible that the inclusion of those teachers' perspectives might

have resulted in different results. Additionally, time since the initial transition to EOT may play a role in terms of memory accuracy. Teachers were reflecting on an experience that, for many, may have been impacted by recall bias. It remains possible also that issues outside of school, particularly during a time of chaos and uncertainty, may have functioned as limitations impacting the study in unknown ways. Indeed, for some the timeframe examined may have been stressful with varying levels of stress impacting participants' perceptions and memories in unknown ways. Finally, it may be that some teachers opted out of the study because of stressful memories. What those teachers may have reported and how that might have impacted the study's generalizability remains unknown but suggests a need for continuing research on EOT.

Discussion

The majority (97.5%) believed that the EOT experience improved their knowledge of how to teach online either somewhat (62.5%) or extensively (35%). A majority perceived that their online teaching knowledge improved as a result of their EOT experiences, with thirty-five percent reporting that they had acquired an extensive level of knowledge about effective online teaching. These findings suggest that perceptions of preparedness to teach online remain high within the sample, even among those only slightly motivated to do so again. Further, perceptions of teacher self-efficacy and perceptions of value for learning demonstrated the highest positive scores on the instrument, with value for collaborative learning demonstrating the lowest positive score. In fact, thirteen teachers (32.5%) reported that EOT had no value for collaborative learning, suggesting an opportunity for professional development focused on helping teachers figure out how best to promote students' online collaboration, particularly given the concerns about student engagement that emerged within the qualitative data. Likewise, recent research suggests the value of student engagement online (Chiu, 2021; Ingram, 2024) which in turn suggests the value of professional development focused on strategies that promote K-12 students' engagement while learning online. Further, while nowhere close to an "extremely positive" (4) level, results for motivation suggests that teachers' motivation to teach again online was generally, but not overwhelmingly positive. Some level of reservations, perhaps based on the challenges faced, remain of enough concern to give participants some pause despite agreement on the EOT experience having value for learning. Recent research reported by Fox (2024) suggests agreement with the assertion and suggests that targeted professional development can improve teachers' motivation to teach online. Finally, the ability to evaluate tools and materials for use when teaching online performed at the highest level (moderately positive), suggesting that teachers have confidence when selecting tools to support online learning. Whether they are confident when selecting tools that specifically promote active student engagement online, however, remains unclear and, therefore, suggests an avenue for future research.

Results identify the positive perspectives of value among participants even as they highlight the challenges many faced. While many found that the EOT experience fostered resilience and adaptability, enabling professional growth, they also encountered challenges and reflected on potential solutions. This finding is reflective of Chaudhuri (2022) and Wang et al.'s (2024) research outlining challenges and opportunities for educators and policy makers. For example, student engagement emerged as both a challenge and an opportunity. As a challenge, a lack

of student engagement likely impacted participants' perspectives regarding the efficacy of online learning at the K-12 level. Whether these concerns directly impacted their perspectives of slight value for learning needs to be examined more deeply. Further, these results suggest a need for professional development focused on both online collaborative learning and active, student engagement. As mentioned earlier, the average level of perceived positive value for learning ranged from 1.05 to 1.9, suggesting that the value for learning was of slight to moderately positive value. That participants found any value for learning is important to know given recent studies documenting serious concerns about learning loss, particularly among rural and high poverty students (Peters et al., 2025). While participants found the EOT experience of limited positive value for learning, more research is needed in this area, particularly because perceptions of slight value reported here are not supported by Cavanaugh et al. (2004) meta-analysis of K-12 online learning which suggested no significant difference between online and face to face learning. It appears that while participants believe that learning did occur during the EOT, they do not believe that learning was substantial. This reflects the varying degrees of learning loss reported by Peters et al. (2025), but it contradicts their reports of substantial learning loss occurring among rural and high poverty students. In summary, whether these results are unique to the EOT era in rural settings or are more broadly reflective of teachers' perspectives of K-12 online learning will require more research.

Implications for Teacher Education

Preparing teachers for online teaching in advance of future challenges, such as human or natural disasters, including future pandemics, is important. The Inclusion of preparedness strategies needs to be reflected within teacher preparation curriculums (Ray & Hocutt, 2016). Further, as these results suggest, helping teachers learn how to position collaborative learning to improve student engagement online is of vital importance as is an understanding of how to effectively integrate use of other research supported online pedagogies, including PBL and other forms of inquiry learning and while motivation to teach again online is generally, but not overwhelmingly positive, results do suggest that teachers understand that the need to shift online likely will occur again. Results also suggest that reservations to do so, perhaps based on documented challenges, must be addressed if we are to ensure future preparedness for online teaching in times of crisis. Indeed, the somewhat less than optimal motivational results reported here suggest that the EOT experience had consequences that may impact the future of all K-12 online learning for some time to come. Whether this is a reasonable conclusion requires future research to parse out more about motivation and its impact of teaching efficacy. While the early chaos of the EOT experience likely impacted the level of motivation reported here, helping teachers understand the purpose of online learning within the larger context of K-12 learning and providing the opportunities to enhance their efficacy with online learning can have value. As such, research focusing on teacher motivation to teach online is recommended.

Despite low levels of reported positivity toward the value of online learning during the EOT era, teachers in this study reported slightly positive perspectives of value for the experience. Reflecting on the experience, many were able to identify both benefits and challenges that teacher educators can learn from. In fact, written responses reported here suggest many were actively reflecting on their online teaching and looking for educational value during the experience. They also suggest that many teachers continue to look back on the EOT experience and are able to find educational value that they may carry forward into other educational

settings and experiences. Out of these reflections it is recommended that teacher education programs provide scaffolded online learning and teaching experiences as a part of teacher preparation programs. Opportunities to experience online learning as a student can translate into an understanding that supports effective online instruction. While programs may resist being entirely online for valid reasons, requiring students to take one or more strategically selected courses online can be beneficial as doing so helps them understand the learner's experience even as they learn how to teach online. Furthermore, teachers in this study succeeded both by translating effective, research based, in person instructional strategies to an online setting even as they failed at times when trying to do so. Not many knew in advance of the pandemic what would work and what would not. For many, every school day was an authentic, real world learning laboratory in which they experimented with face-to-face strategies, reflected on their efficacy, and planned for and made adaptations. While this can be a valuable reflective teaching process for any teacher, forced experimentation within the context of what was a challenging and often chaotic learning context during the pandemic may have put children at risk of learning loss. It also may have been an unintended stressor on teachers forcing some to leave the profession at a time when the need for teachers is high.

Additionally, both introductory and advanced technology integration courses should offer experience with online teaching that allow novice teachers specific, scaffolded experiences with learning management platforms. However, policy makers must also be aware of the impact online teaching on teacher workloads and how teaching during periods of uncertainty place additional stress on teachers (Marshall et al., 2024). However, inclusion of communication, classroom management, and motivational strategies that promote online learner engagement is key. Similarly, opportunities for online peer collaboration and interactions, as recommended by ISTE standards for teachers, (Crompton & Burke, 2024) can be useful for building novice teachers' confidence, willingness, and motivation to teach online. Likewise, opportunities to explore barriers, particularly those associated with the digital divide, are important for novice teachers as consideration allows them to identify ways of overcoming those barriers and succeeding as online instructors.

Implications for Policy Makers

The study underscores the need for inclusive educational policies that address the disparities found in rural/rural-remote settings. Further, the need to prioritize rural education remains. As such, rural/rural-remote K-12 schools need to adopt a flexible approach to teaching that allows for exposure to online learning outside of forced or emergency situations, including ongoing use for weather events. Teachers need to understand the benefits and challenges of asynchronous and synchronous learning environments and know when and why to choose each. They also need opportunities to teach online in ways that scaffold the experience, not just for them but also for their learners so that a full move to online learning is not chaotic or stressful for teachers, students, or parents. That is because having teachers go online without prior knowledge of online teaching resulted in many teachers having to figure out the online teaching process for themselves. This form of discovery learning occurred daily across the early pandemic era for many who engaged in a daily process of trial and error. Given the decades of research documenting effective online instructional methods and strategies, this can be viewed as a systemic failure of both teachers and learners. Given the lack of preparedness across K-12, it is not surprising that learning loss occurred among many learners.

While, perhaps, understandable given the chaotic nature of the early pandemic era, these circumstances and failures cannot be allowed to occur again. Rather, we must be proactive in our determination to equip teachers with the knowledge, skills, and dispositions needed to succeed as online instructors. Finally, as Low (2024) stated, coming out of the pandemic era, policy makers need to examine existing practices and identify strategies that promote "future ready" (p. 395) learners armed with a "life-long learning mindset" that will carry them through the challenges that will occur across their lifetimes (Low, 2024, p. 395). Likewise, this thinking must apply to policy associated with teacher training and teacher certification, with policy adapted or framed in ways that make it meaningful for rural/rural-remote education (Wharton-Beck et al., 2024). Further, teachers' reflections are important for understanding the impact of the EOT experience on K-12 education are important for policy makers to consider, as teachers serve on the frontline where policy is implemented. Consideration assists policy makers' understanding of the current state of education thus allowing them to propose practical solutions that teachers can not only support but also implement effectively. Teachers' perspectives also assist policy makers' planning for future periods of uncertainty or chaos. For example, teachers in this study spent a great deal of time adapting existing content and creating new content to ensure learning occurred. Much of that effort came out of personal time. Policy changes regarding competition and workload for those moving from face-to-face to online instruction could better support those efforts and mitigate some issues associated with teacher motivation and morale (Hurtt et al., 2025).

Conclusion

The results reported here are useful in terms of improving our understanding of the rural/rural-remote teaching that occurred during the recent pandemic era. Results also help policy makers and educators, along with those who train them, identify and share effective policies and teaching strategies that support rural/rural-remote educators and students. However, at present, we simply do not fully understand the depth of these impacts on rural/rural-remote teachers and learners. Nor do we know enough about how these teachers responded to, or adapted to, the move from face-to-face to online learning. Further, the extent of the impact on learning remains unclear at present. Therefore, beginning the process of figuring out how rural/rural remote teachers worked to ensure learning occurred is vital. As is figuring out what worked best and whether those strategies have utility beyond the pandemic years.

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