


## Research

# Emergency remote teaching amid global distress: how did teacher educators respond, cope, and plan for recovery?

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## Abstract

This study explored the emergency remote teaching experiences of Ghanaian teacher educators during COVID-19. The study employed a basic qualitative interpretive approach and purposively interviewed 25 teacher educators from 15 teacher training institutions. Teacher educators in this study reported that emergency remote teaching (ERT) was a learning opportunity and professional capacity-building experience for them to engage in contemporary pedagogical practices. Teachers also indicated that synchronous and asynchronous remote teaching was helpful for their students, as it provided students with the opportunity to engage in self-paced learning due to their access to learning resources at any time. ERT promoted peer teaching, team teaching, and effective collaboration among teacher educators. However, with little preparation and training for remote teaching and learning, both teachers and students struggled with the remote teaching and learning process. A myriad of challenges were identified including the unsuitability and unfamiliarity of online teaching and learning platforms, a high rate of absenteeism and low student engagement, a lack of parental and school support, and inadequate technological resources. The study revealed that mathematics and science teachers needed advanced technological resources to support student learning. Implications for educational policy and practice are discussed.

**Keywords** Remote teaching · Teacher educators · COVID-19 · Sub-Saharan Africa · Higher education

## 1 Introduction

The COVID-19 pandemic resulted in an emergency transition from in-person to remote teaching and learning. With the uncertainty surrounding this shift, teachers are continuously developing alternative approaches to education [1, 2]. In higher education institutions, digital technologies have become essential for emergency remote teaching and learning [2, 3]. Recent studies have indicated that the COVID-19 pandemic has had a global impact on learning outcomes. Research in the global south has demonstrated a loss of learning across different educational levels [4]. In other contexts, studies have shown how the pandemic has influenced policy changes, teacher satisfaction and roles, and increased digital literacy [5–7]. The pandemic has created significant gaps in effective teaching and learning, prompting scholars to explore how

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teachers are adapting to this transition across different contexts [8–10]. While numerous studies have focused on the global north, there is limited research on the experiences of higher education teachers in low-income countries such as Ghana in sub-Saharan Africa. This study aims to explore the experiences of Ghanaian teacher educators, hereinafter referred to as teachers, during their transition to emergency remote teaching.

## 2 Literature review

### 2.1 Emergency remote teaching

ERT emerged in response to the global pandemic caused by COVID-19. It refers to a temporary shift in teaching and learning methods to ensure educational continuity during the crisis [11]. ERT has been studied extensively, with scholars examining its challenges, opportunities, and effectiveness [12–15]. The general consensus from these studies is that ERT is a vital tool to maintain teaching and learning during the pandemic. However, there is often confusion between ERT and online teaching and learning (e-learning), with both unfairly being associated with lower quality compared to traditional in-person methods [11, 16].

Previous research has focused on distinguishing ERT from e-learning. Fuchs [16] examines the differences between ERT and e-learning, pointing out instances where ERT has been mistakenly categorized as online teaching. Other scholars, such as Masalimova et al. [17] and Topuz et al. [18], have addressed the misconception of equating ERT with distance learning and online assessment, respectively. While there is a plethora of literature differentiating ERT from e-learning, online education is characterized by a more robust organizational structure to support e-learning, unlike ERT, which relies heavily on improvisation and rapid response without extensive planning [13, 19, 20].

It is important to acknowledge that while ERT may initially lack the planning and structure associated with e-learning, the use of online platforms and resources can eventually lead to a transition towards e-learning with proper planning and execution [21, 22]. This study focuses on the practice of ERT rather than e-learning, particularly exploring asynchronous and synchronous online teaching strategies employed by higher education institutions during the pandemic.

### 2.2 Related literature on ERT experiences of teachers

The widespread adoption of Emergency Remote Teaching (ERT) during the COVID-19 pandemic exposed educators in higher education institutions to a variety of experiences. These experiences encompassed changes to teaching practices, as well as the opportunities and challenges associated with ERT.

One significant change was the use of online teaching and learning platforms. Mardini and Mah'd [23] argued that Microsoft Teams and Zoom were the preferred platforms for teaching and learning during COVID-19. Similarly, Google Classroom and Alison were commonly used platforms in Ghanaian universities, according to Akomea et al. [24]. In Albania, Hoti et al. [25] found that most university instructors used Microsoft Teams, with fewer using Google Classroom and Zoom. Additionally, Chirinda et al. [26] focused on teaching mathematics in South Africa and found that the WhatsApp platform was widely used by lecturers to support teaching and learning. Other platforms, such as Skype, Telegram, Instagram, Facebook, Twitter, and Smart devices, were also documented as being used for online teaching and learning during COVID-19 [27–29].

The literature also highlights how ERT was conducted. Tan et al. [30] found that most institutions digitized their content, allowing lecturers to replicate face-to-face teaching and learning practices in online platforms. In Albania, Hoti et al. [25] reported that instructors primarily used PowerPoint presentations, recorded videos, and synchronous lessons to deliver their content. Additional visual aids, such as PowerPoint presentations, were used to supplement the synchronous lessons. The use of platforms like YouTube allowed for student participation through comments and questions. Fhloinn and Fitzmaurice [31] conducted a study investigating the experiences of university mathematics lecturers in 29 countries. They found that many lecturers believed live online sessions should be practiced, while others preferred pre-recorded materials. There was also a consensus on the importance of combining non-live and live sessions. Many instructors preferred online discussion or chat forums where they could post learning materials at any time. In some cases, learning materials were streamed on YouTube, allowing for student feedback through chats or emails.

Existing teaching and learning resources were also utilized in ERT. Instructors designed materials in small, easily accessible formats. Formative assessment strategies, including student questioning, were prioritized. Multiple-choice and computer-assisted assessments were commonly used, with options for feedback such as question and answer sessions,

discussions, and peer feedback [31]. ERT presented opportunities for educational inclusion, student-centeredness, and technologically enriched instruction [32, 33]. It allowed for greater flexibility in venue, larger class sizes, asynchronous and synchronous lessons, and the ability to recover lost instructional time [34]. ERT also encouraged student feedback, transparency, and flexibility, thus improving student independent learning [35]. Convenience in accessing information was another benefit of ERT, with recorded lectures allowing students to revisit materials at any time. The use of chat functions allowed for directed feedback, and the internet facilitated quick sharing of information. Other opportunities of ERT included promoting academic meritocracy, teamwork, knowledge sharing, self-regulated learning skills, digital socialization, and healthy academic competitions [36–38].

However, numerous challenges were associated with ERT. Many institutions, instructors, and students were unprepared for the shift to online teaching and learning [39]. Lack of experience and preparation affected the usefulness and integration of technology in ERT. Student engagement and enthusiasm were also negatively affected, with distractions and a lack of interaction in online classes. Inequalities in educational outcomes were exacerbated, particularly for students in deprived areas and rural communities who lacked access to stable internet, computers, and mobile phones [31, 40–43]. ERT also presented infrastructural challenges, including poor internet connection, financial constraints, breakdown of online platforms, lack of study materials and ICT tools, electrical problems, and teacher difficulties in navigating online learning management systems [24, 44, 45]. Instructors and parents also faced health concerns and increased burdens due to long hours spent on screens and challenges in accommodating young children and students with special needs [38, 43].

ERT significantly impacted classroom assessment practices and student performance. Many teachers found online assessment to be difficult and time-consuming, leading to a weak and fragile assessment system. Cheating and unfair assessment practices were reported in some cases. The assessment practices were unbalanced, with a higher emphasis on formative assessments compared to summative assessments. More marks were awarded during teaching and learning, and written tests were minimized in favor of group tasks, activities, and online discussions [11, 21, 43, 46–48].

In conclusion, the shift to ERT in higher learning institutions during the COVID-19 pandemic brought about various modifications to pedagogical practices. Different online teaching and learning platforms were utilized, and both asynchronous and synchronous lessons were implemented. ERT presented opportunities for inclusive education and technologically enriched instruction, but it also posed challenges such as lack of preparation, student disengagement, infrastructure issues, health concerns, and assessment difficulties. It is important to learn from these experiences to plan future teaching and learning practices effectively in a post-COVID-19 world.

## 3 Methods

### 3.1 Design and approach

This study examined the experiences of teachers in Ghana with ERT. Our goal was to analyze teachers' beliefs and practices in how they adapted, coped, and responded to ERT. The main question that guided this study was: what are the ERT and learning experiences of teachers in Ghana? Instead of testing hypotheses, we chose a basic interpretive qualitative approach to understand how individuals interact and experience their social worlds and the meaning they attach to these experiences [49]. As teachers faced changes in teaching and learning in their schools, which are part of their social worlds, exploring the meanings they associated with their actions and lived experiences helped us understand their experiences better [49, 50]. Therefore, the basic interpretive approach allowed us to grasp how teachers interpreted their ERT experiences and the significance they placed on them [49, 51]. Our focus was on finding meaning in teachers' ERT experiences, which required us to collect primary interview data that enabled us to understand teachers' experiences through both verbal and non-verbal communications [49, 52, 53].

### 3.2 Participants and sampling

This study received ethical clearance from the Ethics Committee of Wesley College of Education. Before participating in the study, all participants were virtually met to familiarize themselves with the study and provide their consent. They were all given a detailed explanation of the research objectives, confidentiality measures, and their right to withdraw at any time. Participants were also informed that their involvement was voluntary and that there would be no negative consequences for declining to participate or withdrawing from the study. Those who agreed to participate in the study

signed a consent form to provide their informed consent. Additionally, at the start of each interview, participants were asked if they still consented to have their data collected. All collected data were anonymized and securely stored to ensure confidentiality.

A purposive criterion sampling technique was utilized to select 25 teachers from different backgrounds at 15 colleges of education in Ghana. This sampling method was considered appropriate as it allowed for the identification and selection of participants who were involved in emergency remote teaching during the COVID-19 pandemic. Based on participant availability, in-depth, unstructured, and open-ended individual interviews were conducted over Zoom to allow participants to share their experiences with emergency remote teaching. Participants were asked open-ended questions about their perceptions and experiences with emergency remote teaching during COVID-19 such as the challenges and opportunities it presented. The interviews took place over two months and the average duration of each individual interview was 62 min. A summary of the demographic characteristics of the participants can be found in Table 1.

The descriptions of the participants in Table 1 highlight a diverse range of teaching experiences, ages, and subjects taught. This indicates the wealth of data collected from their varied backgrounds and settings. As this is a qualitative study, our emphasis was on the transferability of the results to populations with similar characteristics rather than generalizing the findings due to the sample size.

### 3.3 Data analysis

After collecting data, we transcribed each individual interview verbatim before beginning data analysis. We carefully reviewed all transcripts to fill in any gaps and verify the authenticity of the data. The data was then analyzed thematically following the approach outlined by Braun and Clarke [54]. Each interview transcript was thoroughly studied to identify recurring concepts, words, and ideas, from which categories were established through an initial coding process. Subsequently, we sought out themes to connect the identified categories. To identify these themes, we divided the analyzed

**Table 1** Demographic characteristics of participants

Parti- pants ID	Gender	Years of teaching experience	Age range in years	Course	Interview dura- tion (minutes)
1	Female	25	50–60	Psychology-related	67
2	Male	2	30–40	Assessment	56
3	Male	22	40–50	Mathematics	61
4	Male	8	40–50	Special Education	70
5	Female	3	30–35	Home Economics	65
6	Female	2	30–40	Mathematics	67
7	Male	30	50–60	English	55
8	Male	14	50–60	Educational Course	58
9	Male	23	40–50	Science	64
10	Male	25	50–60	Mathematics	53
11	Female	20	40–50	English	56
12	Male	14	40–50	English	59
13	Male	8	30–40	Mathematics	66
14	Female	24	50–60	Home Economics	71
15	Male	5	30–40	Science	69
16	Female	9	30–40	Science	67
17	Female	31	50–60	Psychology-related	62
18	Male	28	50–60	Guidance and Counselling	60
19	Female	26	40–50	Statistics and Research	54
20	Male	23	40–50	English	57
21	Male	10	30–40	Physical Education	65
22	Female	14	30–40	Music and Dance	56
23	Female	18	40–50	Assessment	71
24	Male	4	30–40	Visual arts	60
25	Female	3	30–40	Visual arts	61

data into six main sections, which will be elaborated on in the following sections. Enhancing the validity of our findings, we triangulated participants' transcripts, field notes, and recorded interviews. Our attention to reflexive practices during data collection aimed at further improving the credibility of the data. For instance, we refrained from influencing the participants' responses and instead sought clarification on their answers. Each individual transcript was returned to its respective participant for validation of their experiences with ERT as detailed by Birt et al. [55]. Throughout the interview and analysis process, we remained mindful of the participants' perspectives and beliefs, and how they navigated their ERT encounters.

## 4 Findings

The analysis of interview data revealed six themes: (a) remote teaching platforms and capacity building opportunities, (b) remote instructional pedagogies, (c) student attendance and classroom engagement, (d) teacher capacity and preparedness for emergency remote teaching, (e) challenges faced in emergency remote teaching, and (f) key lessons learned and future directions.

### 4.1 Remote teaching platforms and capacity building opportunities

The changes in teaching and learning necessitated teachers to utilize technologies that could meet the immediate needs of students. They mentioned that they were trained in ERT and had access to online teaching platforms such as Moodle, Telegram, and Google Classroom. However, the majority of them ( $n = 20$ ) chose to use Telegram for teaching because it was more suitable for larger classes, had limitless capacity, students were already familiar with it, and could accommodate over 300 students at once. For example, one teacher shared:

Our college agreed to use telegram for teaching and learning. This was because it was able to accommodate a lot of students, especially in core courses, where a teacher has to teach about 300 to 400 students. Other platforms such as WhatsApp and Zoom were not helpful since students complained that they did not have data, smartphones, or computers, and most importantly, they were not able to use Zoom (Participant 3).

Participant 3 expresses a preference for Telegram as a more efficient and user-friendly platform for facilitating teaching and learning, as compared to other alternatives. It is evident that educators prioritize choosing the most suitable platform based on their specific teaching environment and take into account the requirements of their students.

### 4.2 Remote instructional pedagogies

Most teachers ( $n = 21$ ) delivered their lessons asynchronously and described the instructions as primarily teacher-centered. The Telegram platform did not allow them to involve their students. They pre-recorded parts of their lessons and posted them on Telegram for students to respond. Although they shared lesson notes with their students in advance, most of them ( $n = 22$ ) mentioned that online teaching did not contribute to effective student engagement. However, they shared that remote learning provided their students with the opportunity to engage in self-paced learning. Reflecting on their experience, a teacher narrated:

If you're teaching online, it is more or less like a lecture method where you go straight to the point, tell them what you have to tell them, wait for answers, and you respond. That was how it was, that interactive nature wasn't there. You can't do that with Telegram (Participant 6)

Another teacher mentioned:

Using telegram was just like having an audio session with someone...you record what is supposed to be taught and send the recorded file on telegram to the students. The students download the file and respond. Their responses could be in audio or written on the Telegram platform. I must say that the platform helped my students to access the learning resources anytime. I think this was a benefit because they can go over everything I taught and learn on their own (Participant 5).

### 4.3 Student attendance and classroom engagement

The ERT contributed to a high rate of absenteeism among students, as most of them were unable to fully participate in the online lessons. The teachers believed that students' absenteeism was due to a lack of computers and smartphones, poor internet access, and the high cost of data bundles. Consequently, students frequently fell behind their peers who had access to online lessons. Below are some vignettes shared by one of the teachers:

Students' attendance and participation were serious challenges I faced. Actually, the highest number I ever had was about 1/3 of my students (Participant 10).

Another teacher who taught a large class before the move to online teaching asserted:

I had 295 students, but the highest that was ever recorded was never up to 100. Students' engagement and participation during teaching were very poor. Even students' attendance was not encouraging. And most students will join and fall along the way. But later I realized some of them also had issues with internet connection and access to data (Participant 1).

These anecdotes indicate that teachers were prepared to assist their students in accessing virtual learning, but there were certain factors that hindered optimal student engagement and attendance.

### 4.4 Teacher capacity and preparedness for emergency remote teaching

We discovered that the transition to ERT was a new experience for most teachers. They lacked expertise in delivering online lessons, especially for those who believed they were 'before computers'. None of the 25 teachers had prior online teaching experience, which hindered their confidence and ability to integrate different teaching strategies. One teacher shared:

I did not have prior experience using an online platform for teaching and learning purposes. I had no technical know-how and so I was always contacting my college's IT help services for support (Participant 19).

Despite the teachers' limited experience in online teaching, they sought assistance from their colleagues when encountering difficulties. One mathematics teacher mentioned that his department implemented a team teaching approach, where they divided lesson responsibilities and took turns delivering content via Zoom Teleconferencing. This collaborative effort indicates that the teachers utilized team teaching to enhance each other's abilities, fostering a community of practice that encourages peer learning among educators.

### 4.5 Emergency remote teaching challenges

#### 4.5.1 Unsuitability of remote teaching platforms

The use and suitability of online teaching platforms varied among teachers. Social sciences and humanities teachers found online platforms to be somewhat effective compared to mathematics and science teachers. Science and mathematics teachers were unable to teach topics that required rigorous calculations, practical activities, and demonstrations. This suggests that, while online teaching and learning platforms are highly necessary, certain subjects may require more advanced resources to effectively support pedagogical practices. One teacher expressed the following sentiment:

The platform did not support most of the strategies that I use in teaching. For example, you may want to engage students in what we call think, pair, and share and I couldn't use the platform to do it. So, I was wondering how I am going to do it, but I couldn't do so with the online teaching (Participant 15).

Another teacher shared how difficult it was for her to use the remote teaching platform to engage and support students learning. She said:

... The telegram did not allow me to engage in some of the theories that underpin learning. For instance, constructivism theory or model which believes that knowledge exists within the context of learners and therefore they should be guided to construct their knowledge. We were expected to give them... uhm, for instance, talk for learning which



is face-to-face you give a task they prepare and come present. If they finish their colleagues will ask questions. Then the teacher will come in to give final comments. Something like this was not possible with the telegram. (Participant 1)

#### 4.5.2 Inadequate technological resources

Another challenge teachers encountered during remote teaching was poor internet connectivity. In order to access strong internet, teachers had to travel to various locations. Unfortunately, many of these places with reliable internet were noisy environments, which made teaching a difficult task for them. One teacher even reported:

Internet connectivity was a major challenge. Most of the time I had to move from my home to another place just to have strong internet connectivity for teaching. These places are mostly not ideal environments for teaching. There are mostly a lot of distractions (Participant 16).

In this study, teachers also mentioned that the majority of students lacked access to the internet, smartphones, and computers, which hindered their participation in online teaching and learning. While some schools distributed smartphones to students, the expense of internet data bundles posed a barrier to their participation in online lessons. One teacher expressed:

Internet data was very expensive to afford. Though we received some support from the school, but it was not enough. I realized that most of my students did not have smartphones that will allow them to join us on the online platform (Participant 14).

#### 4.5.3 Inadequate professional training in remote teaching

Teachers reported that they received training on how to use the online teaching platform. However, they felt that the training was rushed and insufficient to provide them with the necessary skills to use the platform effectively. One teacher, for example, stated:

Though was some training on how to use the platform but I don't think it was enough. We would have required more training so that everybody would have at least mastered the use of Telegram and also with the learning management platform or system (Participant 20).

### 4.6 Key lessons and future directions

Teachers viewed the online teaching experience as a valuable learning opportunity, through which they acquired new knowledge and skills that can be applied in their present and future teaching practices. They acknowledged the flexibility of online teaching, but the majority expressed a preference for blended/hybrid teaching and learning. One teacher specifically stated:

...now I can say that I have developed a certain skill set in the use of the online platform to assess my students. This is something I have never done before in my teaching career. The recent online teaching has given me the opportunity to learn how to do it. I am not perfect, but I am better than before [Laughs] (Participant 23).

Another teacher commented as follows:

...of course, the online teaching and learning were not that bad. To me, we can adopt what they call blended teaching and learning. Online instructions have some advantages that are not possible in person. ... (Participant 25)

## 5 Discussion

This study explored ERT experiences of teachers in Ghana during COVID-19. We found that teachers used ERT platforms that specifically addressed the immediate needs of students. Most teachers reported that Telegram was the most frequently used instructional platform in their institutions. We found that the teachers preferred Telegram for teaching and learning purposes because of its user-friendliness, familiarity with students, and ability to host large class sizes. This result is consistent with similar studies conducted in low-income contexts. For example, a study by Chirinda et al. [26] that focused on teaching mathematics in South African universities during COVID-19 revealed that most instructors preferred online teaching platforms that were user-friendly, accessible, and familiar to students. Teacher educators in this

study also reported that the emergency remote teaching was a learning opportunity and professional capacity building for them to engage in contemporary pedagogical practices. Recent studies have found similar results, for example, Lei et al. [56] argued that the support and training provided to teachers during the emergency remote teaching had made a significant impact on their practices within the education community. Most teachers who were previously reluctant to have professional development training on online teaching were forced to build the requisite capacity to engage in online teaching [56–58].

Teachers in this study also indicated that the asynchronous and synchronous remote teaching was helpful for their students as it provided students with the opportunity to engage in self-paced learning because they had access to learning resources anytime. Alsayed et al. [59] had similar findings when they explored Saudi Arabia higher education teachers' online learning experiences. In other studies that examined Ghanaian educators' and students' remote teaching, learning and assessment experiences, students reported that access to online educational resources during remote learning supported their learning [60, 61]. Students indicated that they had no such opportunity during pre-Covid era. Given the benefit of self-paced learning in promoting students' learning, most Ghanaian teacher educators continue to make use of the online teaching platforms by uploading educational resources that students can access and leverage to move their learning forward.

In terms of the suitability of ERT platforms, this study found that teachers had different experiences. Although most teachers preferred to use Telegram, our study found that the usage and suitability of ERT platforms differed. For instance, social sciences and humanities teachers found ERT platforms more effective compared to mathematics and science teachers. The science and mathematics teachers who participated in this study reported that they could not teach topics that required rigorous calculations, practical activities, and demonstrations. This finding suggests that, although online teaching and learning platforms are much needed, certain subjects like mathematics and science may require advanced resources to support effective online pedagogical practices. These findings contrast with other studies that reported that all remote teaching platforms are convenient and appropriate for all subjects [26, 62, 63]. Our findings suggest that not all remote teaching platforms effectively support teaching and learning of all subjects. While some remote teaching platforms may be suitable for some subjects, others may not. Therefore, educators seeking to promote effective online learning should consider adopting subject-specific online teaching platforms. For example, Lei et al. [56] posit that three universities in Hong-Kong have been responsively developing their own training resources and remote teaching platforms that suit teachers' and students' needs.

Additionally, we found that teacher educators delivered their lessons asynchronously and described instructions as mostly teacher-centered. More than half of the teacher educators pre-recorded parts of their lessons and posted them on Telegram for students to respond, which is consistent with the literature [25, 30]. Although the teachers in this study shared lesson notes with their students before each lesson, they reported that ERT did not contribute to effective student engagement. While some studies in high-income countries have found that ERT increases student engagement in lessons and promotes self-regulated learning skills [43], the findings from this study contrast this trend of findings and confirm the findings from previous studies in low-income contexts which reported that ERT promotes teacher-focused pedagogical practices and decreases student participation in lessons [44, 64, 65].

Furthermore, this study did not only reveal that students lack engagement and participation in instructional activities, but also showed that remote teaching and learning contributed to a high rate of student absenteeism. According to teachers, several challenges, such as lack of access to smartphones, computers, and other digital devices, poor internet connectivity, and the high cost of internet broadband contributed to the high rates of student absenteeism. This agrees with existing studies that have shared similar findings [24, 44, 45]. Although most teachers were ready and willing to deliver lessons remotely, limited access to technology and the internet hindered maximum student attendance and participation.

It should be noted that the issue of the digital divide, digital inequities, and digital accessibility are not new challenges within sub-Saharan Africa (SSA) countries [66]. Across SSA, most higher education institutions struggled to connect to lessons remotely due to resource constraints and the unpreparedness of the educational institutions during the pandemic [67]. Although digital inequities existed and impacted higher education students before the pandemic, the move to ERT in low-income countries such as Ghana escalated digital disparities and aggravated inequities in educational access [66]. This study showed that digital infrastructure challenges affect most students, especially those of under-resourced and rural communities and therefore, reinforce the existing inequalities in learning and educational outcomes [46, 68].

This study also found that ERT facilitated peer teaching, team teaching, and effective collaboration among teacher educators. Unlike traditional in-person teaching, ERT encouraged teachers to seek support from their colleagues when facing challenges, leading to a more collaborative approach to pedagogy. Educators adopted collaborative teaching



strategies, such as team teaching, to enhance their pedagogical skills and support one another. These strategies promoted reciprocity, relationship building, and a sense of community among teachers, fostering peer teaching and learning as evidenced by previous research [36–38].

## 6 Conclusions and implications for policy and practice

This study examined the experiences of teacher educators in Ghana with ERT during the COVID-19 pandemic. The findings indicate that despite limited preparation and training, the transition to online instruction presented a valuable opportunity for professional development and the adoption of modern teaching methodologies. Teachers were able to explore innovative practices such as peer teaching, team teaching, and collaborative efforts, ultimately enhancing their pedagogical skills. However, this study has identified several obstacles that impeded successful remote teaching and learning. A key challenge cited was the lack of sufficient technological resources, such as high-quality laptops and reliable internet connectivity.

The findings reveal several valuable insights for developing nations to improve remote teaching and learning. One crucial observation is the significant disparity in digital access, which highlights the importance of ensuring equal access to technology and reliable internet for all educators and students. The shift to online platforms by educators has highlighted the value of employing adaptable pedagogical methods that incorporate both synchronous and asynchronous learning activities to effectively engage students. Furthermore, providing adequate training and continual support in digital literacy for teachers has become imperative. This emphasizes the necessity for ongoing professional development opportunities. In addition to training, teachers should be supplied with top-notch laptops and technology appropriate for online instruction. However, while providing high-quality laptops or computers is crucial for advancing online teaching, Peña-López [69] emphasized that policies solely focused on distributing computers do not address the educational digital gap comprehensively. These policies often neglect key issues of accessibility, connectivity, and capacity building, leading to a deficiency in digital skills essential for effective computer usage in higher education. Thus, it is imperative that teacher educators receive training and support to effectively navigate and utilize remote teaching methods. Possessing the necessary skills and confidence in digital competency is essential for a successful online teaching experience [69, 70]. Additionally, teachers require adequate professional development and training on remote teaching platforms.

Effective communication and collaboration among teachers and students, as well as other stakeholders, are important lessons to implement ERT. Additionally, it is essential to rethink assessment strategies, embrace innovative educational technologies such as artificial intelligence, and encourage involvement of all stakeholders as key lessons from this experience. Emphasizing culturally sensitive and inclusive teaching practices that accommodate diverse backgrounds and learning requirements is also important, as students come from different backgrounds and teaching must meet their unique needs. The pandemic also highlights the importance of our readiness for future crises. It prompts developing nations to establish contingency plans and infrastructure to enable seamless transitions between traditional and remote learning settings. These lessons from ERT, based on our findings, are likely to influence education policies and practices in the post-pandemic era to encourage flexibility, adaptability, and equity in remote education delivery.

## 7 Limitations and future directions

This study examined the experiences of ERT among a select group of teachers in colleges of education across all 16 regions of Ghana. Future research could explore the ERT experiences of teacher candidates (students) in colleges of education, as well as conduct a comprehensive mixed-method study on how teachers have adapted to remote assessment. While this study focused primarily on teacher experiences, it serves as a valuable foundation for understanding how Ghanaian educators have navigated ERT and remote learning during the COVID-19 pandemic.

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**Data availability** The qualitative data used in our analysis is available based on a reasonable request from the corresponding author.

## Declarations

**Ethics approval and consent to participate** The research was ethically approved by the Ethics Committee of the Wesley College of Education. Prior to participation, all participants were duly informed of their rights and responsibilities and provided explicit written consent. The study was conducted in agreement with the guidelines governing research involving human participants, as outlined by the Ethics Committee of the Wesley College of Education.

**Competing interests** On behalf of all authors, the corresponding author states that there is no conflict of interest.

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