# Teacher Resilience During COVID-19: Comparing Teachers' Shift to Online Learning in South Africa and the United States

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## Abstract

The Covid-19 pandemic created the largest global disruption of education in recorded history. This unique qualitative study examined teacher resilience as they taught remotely with technology during the pandemic, and the experiences of teachers with a comparison across a developed country (US) with a developing country (South Africa). Data from a teacher resilience survey was gathered to explore factors of teacher resilience and interview data provided insight into teacher experiences. A grounded coding methodology was used to analyze the content. Within the examination of the extant literature, a Socio-Ecological Technology Integration framework (SETI) was developed and presented as a lens to conceptualize the full extent of all the socio-ecological factors involved in teacher technology integration including those in the school, district, and nationally. The findings reveal that teachers in South African reported less support and resources and greater challenges, yet overall reported themselves as more resilient than teachers in the US. From the findings, six factors emerged that impacted teachers' experiences during ERT: self-efficacy, growth, motivation, resources, support, and teacher challenges. The major challenges from both countries were: time management, student issues, isolation, anxiety, meeting student needs, technology, and student engagement.

**Keywords** Emergency remote teaching · Pandemic · COVID-19 · South Africa · Developing country

The COVID-19 pandemic created the largest disruption of education in recorded history (United Nations, 2020). This pandemic affected 94% of the world's student population and up to 99% of those in low and lower-middle-income countries (UNESCO, 2020). With the social distancing requirement needed to reduce the pandemic spread, teachers were required to use remote instruction with technology as part of a crisis response protocol to continue education (Bozkurt & Sharma, 2020; Thompson & Copeland, 2020). During this study, this form of instruction is referred to as Emergency Remote Teaching (ERT) to highlight the difference from other forms of planned online learning.

In a recent systematic review (viz., Crompton et al., 2021a), data show that teachers needed various supports for ERT, including digital pedagogical strategies, frameworks, digital tools, equitable practice, and mental wellness supports. Data also show that teachers faced emotional and psychological turmoil while teaching during emergency situations (Crompton et al., 2021a). For example, teachers felt isolated when working away from colleagues (Trikoilis & Papanastasiou, 2020). During COVID-19, early findings indicate the connection between resilience and mental well-being, with positive correlations between resilience and psychological well-being, life satisfaction, and positive affect (Zadok-Gurman et al., 2021).

These studies are informative, but further research is needed to better understand teacher resilience to recognize the factors that most influence teacher resilience while switching to remote learning with technology during the COVID-19 pandemic (Zadok-Gurman et al., 2021). Furthermore, it appears that there have not been any studies

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conducted on teacher resilience and developing countries during the pandemic. The technological infrastructure and resource differences within developed and developing countries could impact teacher resilience. Therefore, the purpose of this study is to further examine teacher resilience during COVID-19 as teachers were using ERT and to explore differences in teacher resilience across developed and developing countries.

## Background

### COVID-19

The novel human coronavirus disease 2019 (COVID-19) was first reported in Wuhan, China, in 2019 and subsequently spread globally to impact the lives of people around the globe. By November 2021, almost two years after COVID-19 was first identified, more than two hundred million confirmed cases and over 5 million lives were lost to the disease (worldometer, 2021). The severity of this pandemic caused people's lives to be upended in multiple ways. One of the most significant challenges occurred in education. More than 1.5 billion learners of all ages from around the globe were affected due to school and university closures due to COVID-19 (UNESCO, 2020; Bozkurt & Sharma, 2020). The inability to meet in person affected about 90% of enrolled students worldwide (UNESCO, 2020) and created the need for schools to find and develop alternative ways of providing education.

### Emergency Remote Teaching

This shift from the traditional face-to-face form of teaching to one born out of an immediate unforeseen necessity required educators to understand and frame what happened to teaching and learning during the COVID-19 pandemic with a different lens (Thompson & Copeland, 2020). Educational establishments across the world have been using online synchronous and asynchronous programs for decades (Arnesen et al., 2019). Before the pandemic approximately 2.7 million students were taking planned online classes (Barbour, 2019). While many educators may be adept in the art of online teaching, prior to the pandemic school closures research reveal a general lack of awareness of the actual scope of online learning, (Siko and Barbour, 2022). Educators may be more familiar with blended learning as educators include some aspect of online learning with face-to-face learning (Hrastinski, 2019). Those teachers using the blended approach may have more of an understanding of online tools and pedagogies to prepare them when they went online for ERT. That said, both online and blended learning are planned with both teachers and students typically prepared for the experience with time to gather all the necessary requirements for a successful experience.

What occurred as students and teachers responded to the educational crisis brought on by COVID-19 can best be described as Emergency Remote Teaching (ERT; Bozkurt and Sharma, 2020). Compared to experiences planned from the beginning and designed to be taught online, ERT is a temporary shift of instructional delivery to an alternate delivery mode due to crises. ERT involves using fully remote teaching solutions for teaching and learning that would otherwise be delivered face-to-face or as planned blended or hybrid courses. The primary purpose in these emergency circumstances is not to create a robust educational system but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency (Hodges et al., 2020). Globally, COVID-19 disrupted education worldwide, causing the need for ERT equally in both developed and developing countries (UNESCO, 2020), such as the USA and South Africa.

### COVID-19 ERT in the USA

Most schools closed in the US at the start of the pandemic in March 2020. Despite earlier calls for the development of emergency school closure plans (viz., Wong et al., 2014), the majority of the educational institutions in the US were not prepared to transition to having students learn remotely (Francom et al., 2021). Emergency remote teaching in the United States varied from community to community and varied at different times throughout the pandemic. Teachers' instructional assignments were not static during the 2020–21 school year. Most teachers experienced face-to-face, remote and hybrid teaching arrangements, all within the course of the school year. In addition, many teachers were teaching in multiple situations simultaneously (Arnett, 2021).

### COVID-19 ERT in South Africa

Based on the criteria of the World Population Review (2021), South Africa is considered a developing country. At the onset of COVID-19 in South Africa, the government was forced to enact a national lockdown, causing the closure of all educational establishments (Government of South Africa, 2020; World Bank, 2020). Primary and secondary school education sectors in South Africa are governed by the Department of Basic Education (DBE). Many schools governed by DBE had to close and provided no schooling at

the start of COVID-19 as the African continent had numerous technological challenges, such as a lack of infrastructure, broadband, and data costs (Moloi, & Mhlanga, 2020). As the pandemic continued, schools continued learning with ERT while navigating those infrastructure limitations.

Multilateral and bilateral organizations, such as UNESCO, mEducation Alliance, and the World Bank, worked to provide some government guidance on communication tools and strategies to continue learning in developing countries (World Bank, 2020). As the COVID-19 pandemic became longitudinal, governments, including South Africa, realized that learning must continue, and alternative strategies, including basic technologies, such as radio and television, were used (Moloi & Mhlanga, 2020). It is important to note that families in South Africa were challenged to ensure that learning continued along with ensuring their basic needs were met, (La Grange, 2021), such as running water (Ellis, 2020) and conssistent electricity (Kambule et al., 2019).

## ERT and Technology Integration Frameworks

Online learning is often driven by stakeholders who have a variety of concerns and expectations of how it should occur (Achebo et al., 2019). Fortunately, there are a variety of technology integration frameworks that are used within planned online education that supports the educator in effectively thinking, planning, and implementing technologies in ERT. Frameworks include the Technological Pedagogical, Content Knowledge (TPACK: Koehler & Mishra, 2008); Substitution, Augmentation, Modification, and Redefinition Framework (SAMR: Puentedura, 2009); and Social-Ecological Technology Integration Framework (Crompton, 2017). TPACK has educators considering the three knowledge, technology, pedagogy, and content knowledge, working together in unison to integrate technology. RAT and SAMR both have the educator consider how technology is being utilized to provide additional affordances beyond nontechnology options.

The Crompton (2017) social-ecological technology integration framework highlights the educator's technology integration mediated by various contextualized systems that focus on environmental factors, including the physical environment, which includes resources, such as technologies available, as well as the social ecology of interactions between people within those contexts. Crompton posits that the entire social and ecological system needs to be considered to understand technology integration. However, it appears that additions need to be made to the framework to further include remote teaching aspects that include ERT and planned online experiences. An adapted Crompton's framework is presented in Fig. 1 as the Social Ecological Technology Integration (SETI) framework and explained further in the next section.
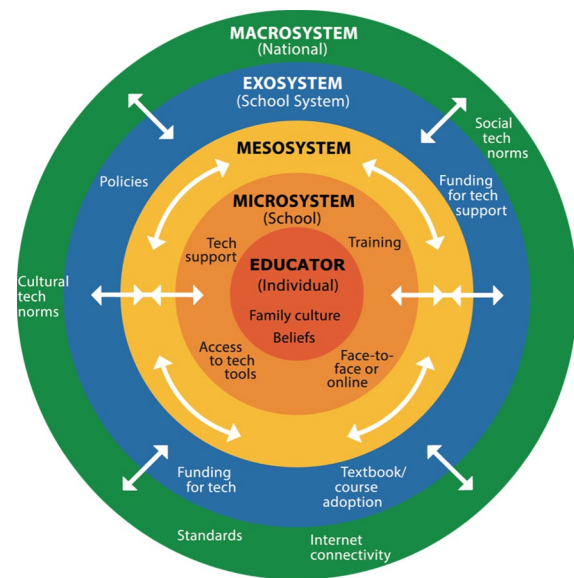


**Fig. 1** Social Ecological Technology Integration (SETI) framework

In the SETI framework, the concentric circles around the educator represent the different systems determining how that educator integrates technology. At the very center of the framework, the educator is using their beliefs and family culture to make decisions on technology integration. The microsystem is the immediate school milieu surrounding the educator, which includes access to technology, students, training, and tech support. The exosystem is the school district, which includes funding for technology support and training as well as policies. The outer ring is the macrosystem which shows how the integration of technologies is mediated by the national milieu, such as the social, religious, and cultural norms of that nation, as well as standards and internet connectivity. The mesosystem highlights the interconnected nature between and across the structures of the (educators) system (Berk, 2000).

Within this study, adaptations were made to Crompton's (2017) framework by adding students in the microsystem, which includes the educator having knowledge of the student's demographics and preferences that may influence how a student interacts with the technology. Furthermore, during COVID-19, it became evident that families are a part of the socio and ecological culture. Recognition of family is also important during non-emergency times, as factors such as space and quiet are needed. Thus "Family" was added to the very inner circle of the Educator. Family refers to family culture and organization and recognizes family customs, culture, and traditions, as well as navigating family, shared workspace, and home responsibilities in caring for others. The SETI framework is helpful in examining the various contexts surrounding educators' ERT and serves as a lens to uncover connections to teacher resilience in this emergency.

## Teacher Resilience

A review of the literature on teacher resilience reveals several definitions for teacher resilience, such as a characteristic that enables teachers to maintain their commitment to teaching and their teaching practices despite challenging conditions and setbacks (Brunetti, 2006), using energy productively to achieve school goals in the face of adverse conditions (Patterson et al., 2004), and a way of interacting with events in the environment that are activated and nurtured in a time of stress (Tait, 2008). For this study, teacher resilience is defined as a process of capacity for, or outcome of positive adaptation and ongoing professional commitment and growth in challenging contexts (Beltman and Mansfield, 2018). This definition was selected as a definition that captures the main components of various definitions.

Factors that promote resilience are often categorized as 'internal and external processes and 'supporting and contextual resources comprised of personal and external resources' that dynamically interrelate over time as a complex, idiosyncratic, and cyclical construct, involving the dynamic processes of interaction over time between a person and their environment (Lipsitt & Demick, 2012). Beltman et al. (2011) echoed this characterization, who described teacher resilience as manifested by how teachers respond to challenging or adverse situations. In addition, the contexts in which teachers work have been shown to provide both protective and risk factors (Beltman et al., 2011). The SETI framework (Fig. 1) provides a lens to examine the various social and ecological contexts described by Lipsitt and Demick and teacher resilience while integrating technology during ERT.

At this time, there have been studies conducted regarding education during COVID-19. These include what supports educators need for teaching COVID-19 (Crompton et al., 2021a), the global state of education COVID-19 (Crompton et al., 2021b, 2021d), and educational technology equity issuesCOVID-19(Azevedo et al., 2022; Crompton et al., 2021c, 2021e). However, scholars report that more research is needed on teachers and ERT during COVID-19 (Crompton et al., 2021a, 2021b; Zadok-Gurman et al., 2021). Empirical evidence has highlighted the mental stress on educators as they navigate limited resources (Soudien et al., 2022), isolation from colleagues and students (Trikoilis & Papanastasiou, 2020), and learning new educational pedagogy/andragogy and new technologies (Thorn and Vincent-Lancrin, 2022). However, it appears that there has not been any published research to examine teacher resilience during ERT from COVID-19 or other emergencies. While organizations highlight the concerns for developing countries (viz., World Bank, 2020), research has not examined educator experiences comparing developed and developing countries.

## Purpose

To ameliorate the gap in academic understanding of teacher resilience during ERT (Crompton, 2021a, 2021b, Zadok-Gurman et al., 2021) and uncover the differences in educator experiences (physical, virtual, and psychological facts and events) across countries, the overarching question guiding this study is: What were the levels of teacher resilience and what were the factors that impacted the experiences of teachers in SA and the US while teaching remotely with technology during COVID-19? To further refine this question, three sub-questions guided this study. During the COVID-19 pandemic:

1. What were the similarities and differences between teacher resilience levels in the US and SA during ERT?
2. What were the similarities and differences between the teaching experiences of US and SA teachers during ERT?
3. What were the trends between US and SA teacher resilience and teaching experiences during ERT?

## Method

### Participants

Ten in-service teachers took part in this study. Three males and two female teachers from the United States (US) and South Africa. The participants were a convenience sample of students who had been enrolled in further education classes at a university on the east coast of the US and at a university in Western South Africa. These teacher participants were chosen as they had all moved from teaching face-to-face to teaching 100% online during the pandemic. Participants from the US and South Africa taught middle and high school students who ranged from 11–18 years old. To connect with a variety of educators while gaining an in-depth qualitative review of activities, the participants selected from the university classes had a range of teaching experience 1–17 years and covered a variety of subject areas.

### Context

Data collection for this study took place in March 2021, one year into the COVID-19 pandemic. Teachers in the United States and South Africa have been conducting emergency remote education since the closure of schools in mid to late March 2020.

## Procedure

A case study methodology (Yin, 2018) was utilized for this study. The participants began by completing the online Teacher Resilience Scale (TRS) survey (Daniilidou & Platsidou, 2018). The survey measures the internal and external protective factors that affect teachers' levels of resilience. Then 7–10 days after the survey, the participants were individually interviewed using questions based on Crompton's (2017) adapted SETI a priori framework. The semi-structured interview involved questions about their experiences teaching during the pandemic (see Appendix 1). The interviews were then transcribed and coded. The ecological framework provided an a priori framework to cover ecological spheres, e.g., the school and district, as the deductive examination. Next, the transcribed text within each of these areas was then subjected to inductive grounded coding to capture themes emerging from within each of those areas. Data from the surveys and interviews were then cross-examined to uncover similarities and differences in the participant responses.

## Data and Analysis

Data from this study consisted of responses to the TRS Survey (Daniilidou & Platsidou, 2018) and the interview transcripts. The TRS survey (Daniilidou & Platsidou, 2018) was developed by examining the validity and reliability of the Connor-Davidson Resilience Scale (CD-Risc; Connor & Davidson, 2003) and the Resilience Scale for Adults (RSA; Friborg et al., 2005). The TRS is explicitly developed to be used with teachers. The survey consists of 26 short questions with a five-point Likert (never, rarely, sometimes, often, always). The questions are categorized into five areas: personal competencies and persistence, spiritual influences, family cohesion, peer support, and social skills. Participant responses were totaled for both countries and converted into a percentage.

Data from the interviews were organized into the a priori sections to examine the social and ecological environments highlighted in Crompton's (2017) adapted SETI framework to determine if the participant was referencing support they gained through their (1) personal life, (2) school, (3) district, and (4) nation. Interview responses for those sections were then examined using grounded coding (Strauss & Corbin, 1995). Researchers used in vivo coding (Saldana, 2015) to align to the participants' language. A grounded coding design with a constant comparative method was conducted as researchers identified important language from the data. Through an iterative, inductive coding process, the initial codes that emerged then led to axial codes with a constant comparison of participant responses with responses, of responses with codes, and codes with codes. Codes were

considered theoretically saturated once all the highlighted responses fit with one of the codes.

## Findings and Discussion

The three questions guiding this study organize the findings and discussion section. First, the teacher resilience levels are presented and then the similarities and differences are discussed. Next, the findings of teaching experiences during COVID-19 are presented. Finally, the teacher resilience levels, and teaching experiences are examined together to identify any trends.

### Q1: What Were the Similarities and Differences Between Teacher Resilience Levels in South Africa and the US?

Data from the TRS reveals a difference in the overall average score for gender across the small group of participants in the two countries. The average resilience score for teacher participants in South Africa revealed a large difference between males 91% and females 71%. One potential reason for this gap may be due to the cultural norms of women in South Africa, as they are generally the primary person in the family who ensures that all the domestic needs are taken care of. Men are less involved in the day-to-day life of managing a home. The South African society is patriarchal, leading to the belief that a "woman's social responsibility is to take care of all things relating to the home and the welfare of her family" (Parry & Gordon, 2021. p. 802).

Unlike in South Africa, the difference in the US between males' and females self-reported resilience scores was minimal (81% vs. 79%). The distribution of domestic work in the US takes on more of an egalitarianism structure the distribution of domestic work between men and women (Altintas & Sullivan, 2016). As the Covid lockdowns took place, women in South Africa looked after the family at home and the sick. The US family lockdown most likely involved males and females supporting childcare, caring for the sick, and general domestic work.

In more granular details of the survey data, Daniilidou and Platsidou (2018) divided the TRS survey into five areas: 1.) personal competencies and persistence, 2.) spiritual influences, 3.) family cohesion, 4.) peer support, and 5.) social skills. Table 1 provides a visual representation of the survey results by teacher participants and country.

### South Africa

Social skills were the highest factor promoting resilience reported by South African teacher participants (94%). This high number may be due to the community culture in South

**Table 1** Teacher Resilience Scale (TRS) Survey Data

| | Personal Competencies and Persistence | Spiritual Influences | Family Cohesion | Peer Support | Social Skills |
|---|---|---|---|---|---|
| **South Africa** | | | | | |
| Xolani | 89% | 80% | 90% | 65% | 100% |
| Nyasore | 91% | 87% | 97% | 85% | 95% |
| Gabra | 84% | 100% | 100% | 100% | 100% |
| Thulile | 67% | 60% | 80% | 60% | 80% |
| Bonolo | 87% | 73% | 40% | 65% | 95% |
| Average | 84% | 80% | 81% | 75% | 94% |
| **USA** | | | | | |
| Arthur | 90% | 87% | 80% | 75% | 80% |
| Peter | 84% | 33% | 93% | 90% | 90% |
| Wayne | 78% | 67% | 90% | 75% | 70% |
| Donna | 96% | 100% | 80% | 65% | 70% |
| Elizabeth | 73% | 47% | 93% | 85% | 80% |
| Average | 82% | 67% | 87% | 78% | 78% |

Pseudonyms used

Africa, which focuses on "Ubuntu," which simply means, I am because you are. "Ubuntu" focuses on collective or community dimensions and responsibilities and emphasizes reciprocation as fundamental to an Ubuntu worldview. There is also an implied and expected indebtedness of persons to the community (Idoniboye-Obu, & Whetho, 2008 p. 229). This culture of working together would necessitate a high degree of social skills to successfully live as a community.

The lowest resilience factor reported by teachers from South Africa was peer support (75%). With the social Ubuntu South African culture, this may have made it difficult during the isolated lockdown which made it difficult to provide support to one another. Gatherings were not allowed, and citizens were asked to maintain social or physical distance while wearing face masks. These regulations affected the socialization of educators and most likely influenced the amount of peer support they received. The remaining resilience factors reported by South African teacher participants were all in the 80% range: personal competencies (84%), family cohesion (81%), and spiritual influences (80%).

### United States

The highest factor reported by US teacher participants was family cohesion (87%). The similarities between the gender scores in the US may provide insight into why family cohesion is the highest. If teachers feel they are members of a family unit that distributes work equitably, then family cohesion becomes the most important source of resilience. The lowest factor reported by teacher participants from the US was spiritual influences (67%). Data from 2020 indicates a continued decline in Americans identifying membership in houses of worship, dropping below 50% for the first time, with 2020

data reporting that only 47% of Americans said they belong to a synagogue, mosque, or church (Jones, 2021). This lack of affiliation with a religious group could be one reason spiritual influences were the lowest identified resilience factor by US participants. The remaining resilience factors reported by American participants were personal competence and persistence (82%), peer support (78%), and social skills (78%).

### Q2. What were the Similarities and Differences Between the Teaching Experiences of US and SA teachers?

In this study, the SETI framework was used, based on Crompton's integration framework (2017), which provided a model for creating a priori interview questions regarding factors that impacted teachers' experiences while teaching remotely with technology during COVID-19. Six codes emerged from the grounded coding analysis: 1) self-efficacy, 2) growth, 3) motivation, 4) resources, 5) support, and 6) teacher challenges. The six codes frame this section of the similarities and differences. These codes are also similar to some of the factors identified by Beltman et al. (2011), who found that self-efficacy, intrinsic motivation, and collegial support were likely to contribute to teacher resilience. Within the seven codes, axial codes further explicate the issues within each of the factors.

### Self-Efficacy

Self-efficacy is "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations."(Bandura, 1977 p. 191) Bandura described these beliefs as determinants of how people think, behave, and feel. As teachers moved quickly to ERT,

believing that they could be successful in this teaching environment was important. Figure 2 displays the axial codes of self-efficacy. In the figures for the axial codes, the codes in which teachers from both countries stated these ideas are color-coded in green. Ideas that appeared in only one country are white.

In both South Africa and the US, teacher participants reported that prior experience with using technology was an important factor in their success in teaching remotely. participants in the US specifically cited military experience and graduate courses as preparing them to teach online. Teacher participants in both countries noted their own personal belief systems regarding the positive impact of technology use as a factor impacting their success. Prior research has indicated that there is a positive relationship between teacher beliefs about technology and its use in the classroom (Russell et al., 2003). Therefore, these participants may have put effort into using technology for ERT to ensure it successfully matched those positive beliefs. Participants in both countries saw themselves as advocates for using technology in learning. For example, Donna from the US stated that "online education is an equalizer for rural and marginalized people [in the US]. Technology can change how we look at the future of education." Gabra from South Africa stated, "I have been advocating for online teaching. The pandemic provided an opportunity for those advocating to do it."

South African teacher participants identified the personal traits of being able to learn on your own and think on your feet as determinants of their self-efficacy. This thinking may come from having to be self-sufficient with fewer resources and support in a developing country. Teacher participants in the US focused on professional commitment as a large contributing factor. participants in both countries identified the need to be able to draw upon prior experiences and their own belief systems to empower their belief in their own capabilities to successfully meet the challenge of ERT.

## Motivation

Motivation is the impetus that gives purpose or direction to behavior and is a person's willingness to exert physical or mental effort in pursuit of a goal or outcome (APA Dictionary of Psychology, 2020). Motivation was mentioned a variety of times by the participants, and the axial codes can be seen in Fig. 3.

There were commonalities between axial codes for South Africa and the US regarding what motivated teachers during ERT. Similarities include ensuring students were learning, professional pride, and personal belief systems. Codes from both groups show that teachers believed that technology was an equalizer in education. This motivated them to use ERT to provide examples of how technology could be used to make this happen. Some differences between country codes were that teachers in South Africa were motivated because they believed that technology makes lessons interesting. They wanted to provide support for their students and their fellow teachers.

Gabra from South Africa stated, "my motivation for teaching online is to be able to create for everyone the opportunity to be educated." Teacher participants in the US reported that they felt motivated because they did not want to appear incompetent. Wayne from the US stated that "I didn't want to appear clueless in front of the kids." Interestingly, self-appearance was a motivating factor for respondents in the US. One possible explanation may be the South African connection to the Ubuntu (Idoniboye-Obu & Whetho, 2008) spirit of community and the US showing more of an individualistic culture. This is shown in Hofstede's (2011) cultural dimensions of individualism versus collectivism in the language of "we" and "everyone" against the words "I". Hofstede's individualism index lists the US first as the most individualistic culture scoring 91, and South Africa 16th with an Individualism index score of 65. Hofstede postulated that individualism is often connected to wealth in a country, as may appear to be the case in this study.
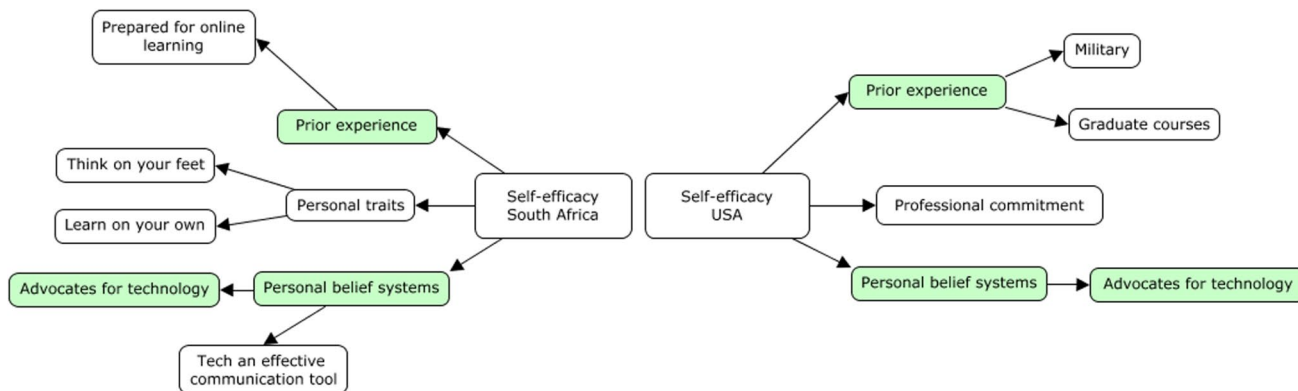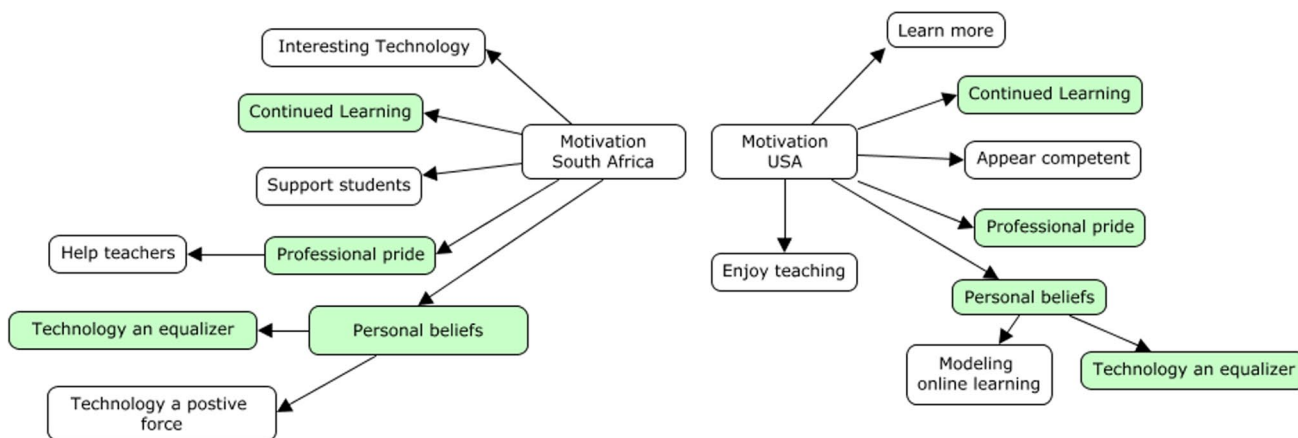


Fig. 2 Self-efficacy axial codes

**Fig. 3** Motivation axial codes

## Growth

Teacher participants from both countries reported experiencing professional growth during ERT. Figure 4 reveals the axial codes resulting from the examination of growth. Similarities show that participants in both countries identified that learning new digital skills and learning new technologies helped them navigate ERT.

Growth for South African teacher participants also involved learning from other teachers and understanding that learning can happen anytime and anywhere. The ability to learn anytime and anywhere is a common comment in the literature as technologies are now more portable and provide technological support to learners often regardless of spatial or temporal constraints (e.g., Dabbagh et al., 2019). Teacher participants from the US did not note this, and it may be due to having been exposed to this technological affordance for a more extended period of time. Participants in both the US and South Africa described that they grew in their knowledge of more advanced use of technology and learned several new technology tools. Donna from the US stated that "I didn't

know how to use zoom. No one had ever trained me on it, and I didn't know how to do it." Gabra from South Africa reported, "I know things now on a different, more advanced level." It would be interesting for further researchers to determine if the growth experiences during ERT transfers back to in-person classrooms. Will the teachers continue to use the new digital skills they learned once they are back face-to-face?

## Resources

Teacher participants from both countries identified hardware, physical space, local internet providers, and government TV channels as resources upon which they drew during ERT. The differences in the degree of available resources became evident in the descriptions of the categories. See Fig. 5 for the axial codes.

In South Africa, the only hardware that teacher participants mentioned was the availability of a copy machine to make paper copies for students to use at home. Whereas, in the US, teacher participants stated that they received various hardware resources to support ERT, i.e., laptops, webcams,
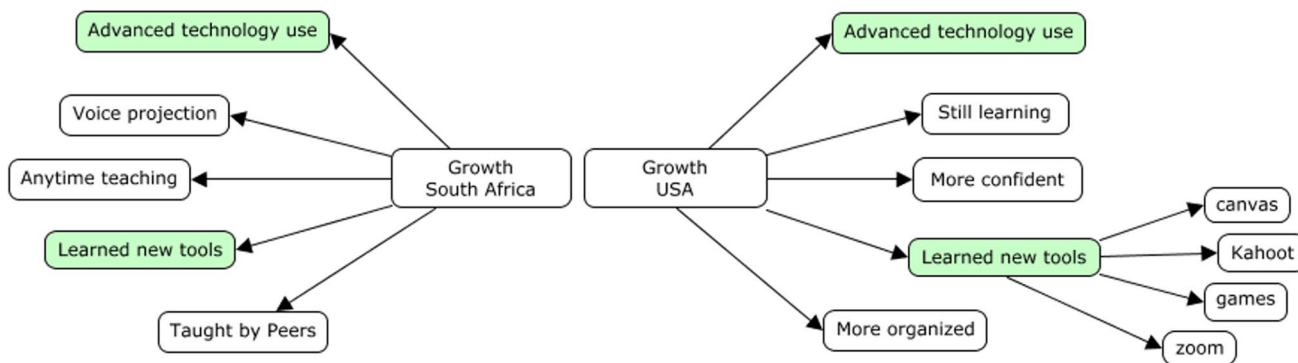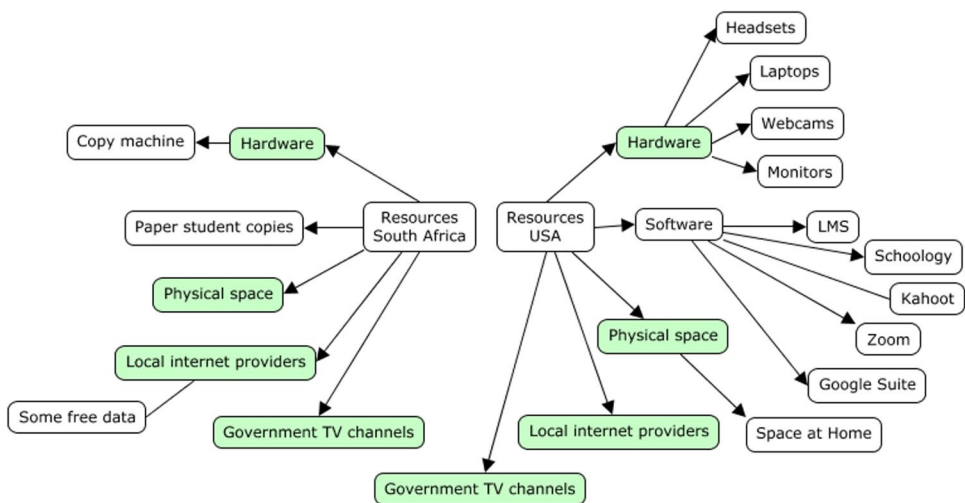


**Fig. 4** Growth axial codes

**Fig. 5** Resource axial codes



monitors, and headsets. None of the participants in South Africa reported that software was provided as a resource. However, software was reported as a resource numerous times by US participants. Some of those mentioned included LMS, Kahoot, Schoology, and Google Suite. It appears that the participants in South Africa were far less resourced with technologies than the teacher participants in the US.

## Support

Teacher participants in both countries reported four categories of support during ERT: school, family, training, and community as axial codes of support. The additional axial codes can be found in Fig. 6.

During ERT teacher participants in both countries reported subject matter experts, administrators and IT as

support.. Monetary support was provided in different ways across the countries. In the US, two participants reported receiving financial bonuses from their school during this time, while South African participants reported receiving free data support after they had initially had to pay for their own to continue teaching with ERT. One school support that was only reported by participants from South Africa was a trimming of the curriculum in response to the challenges presented during ERT. Trimming referred to the reduction in the objectives taught from the curriculum as a method of ensuring that key objectives were still covered during the reduced teaching time.

In South Africa, teacher participants described family members supporting them by sharing their data to help support ERT. Training was reported as a support for participants in both countries. Community support came in the form of
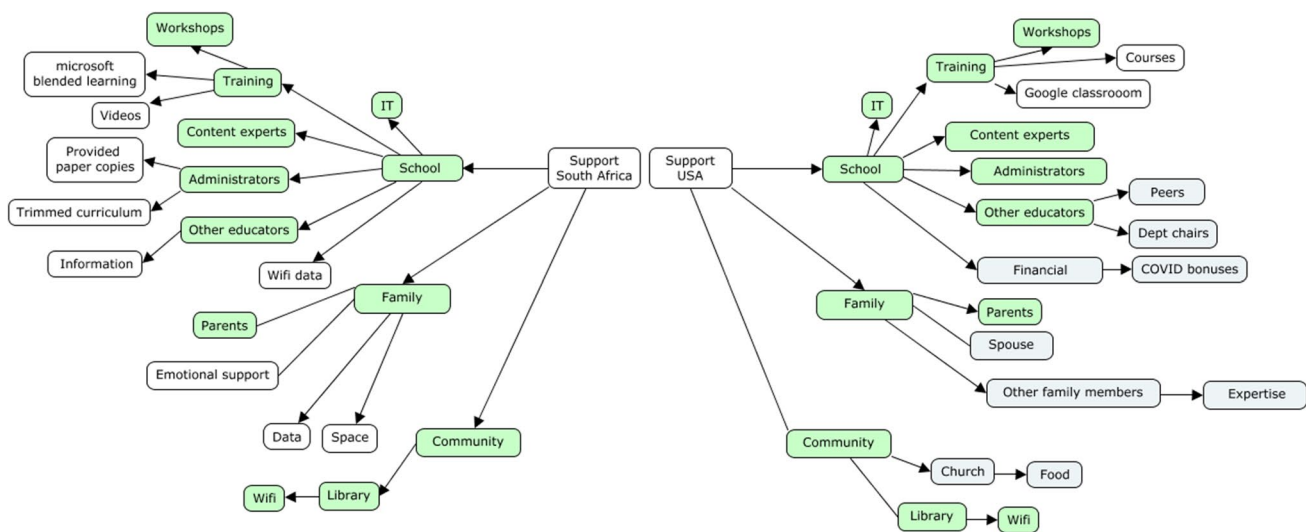


**Fig. 6** Support axial codes

libraries in both countries providing Wi-Fi access to students. In the US, local churches supported students by offering free meals.

## Teacher Challenges

Teachers faced significant challenges during ERT. The pandemic caused schools to close and reopen in a virtual environment with no opportunity to prepare either teachers or students for the ERT environment. There is a long list of challenges identified by teacher participants in both countries including: time management, student issues, isolation, anxiety, meeting student needs, technology, and student engagement. There appeared to be an almost unanimous consensus from all teacher participants within both countries on what the major challenges were during ERT. See Fig. 7 for the detailed list of axial codes for the challenges teacher participants faced during ERT.

One challenge reported only by US teacher participants related to the instructional limitations of ERT. US teacher participants felt they could not teach in the way they did for in-person teaching. In addition, US participants also reported parental concern regarding invasion of privacy in that the daily presence of the online classroom presented a threat to private family life. The major difference between the teacher participants in South Africa and the US appeared in connection to the technology challenges. Although teacher participants in both countries had to work with unreliable and poor internet connectivity, participants in South Africa appeared to have more connectivity and technology challenges. Unlike their American counterparts, participants in South Africa did not have access to affordable unlimited

Wi-Fi access. This caused teachers to use their own financial resources to be able to teach their students.

Wi-Fi access in South Africa is expensive. The average cost per gigabyte from major mobile network providers is R38.93 [$2. 57]. This places South Africa 136th worldwide in terms of data affordability, making it 22 times more expensive than the cheapest data cost average in the world (Biggs, 2021). Teachers in South Africa also had to deal with unreliable electricity, sometimes making them unable to teach. It is interesting to see this juxtaposition of the challenges in the US from parents' privacy concerns and the challenges from South Africa in the lack of electricity and Internet access.

## Q3. What are the Trends Between US and SA Teacher Resilience and Teaching Experiences during ERT?

The analysis of the experiences of both groups of teacher participants reveals that the participants in South Africa appear to have faced more challenges during ERT than their US counterparts. Teacher participants in the US received significantly more resource support from their schools, including laptops, webcams, monitors, and headsets. In some instances, participants were given bonus pay during ERT. The only resource support reported by South African participants was access to a copy machine. Despite these more significant challenges, the participants in South Africa reported a higher level of resilience.

The higher resilience scores may be attributed to the fact that South Africa is a developing country, and the citizens recognize that the government has limited resources, and they may have more experience in using available resources
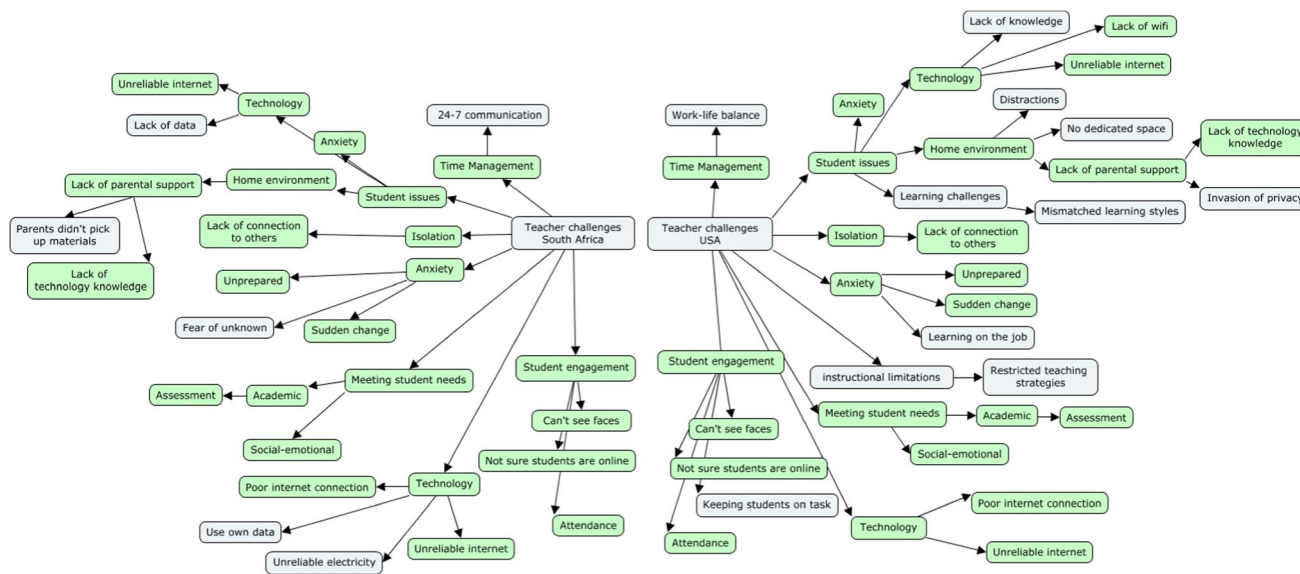


**Fig. 7** Teacher challenges axial codes

to make things work. They have learned to "make do" with what they have. McKaiser (2015) posited that some poor schools in South Africa are doing well academically due to community ownership of the school. This connects to the community piece that has been threaded throughout the data in this study. South African teachers contribute to the welfare of their schools and in return, secure for themselves a powerful identity and sense of personal and social efficacy (Morgan, 2011).

The data show that the greatest disparity in resilience scores was in social skills. South African participants' resilience score in this area was 94% versus 78% for US participants. The data shows that the South African culture is one of community, necessitating the need for highly developed social skills for success. Participants in South Africa also reported significantly less resource support, possibly requiring them to use their social networks for resources and other supports to be successful during ERT. One of the traits Americans value is individualism and self-empowerment (Hofstede, 2011; Rosenbaum, 2018). This sense of relying on one's own sense of personal agency rather than the power of the collective requires less use of social skills to be successful. This may explain the lower resilience score for social skills for US participants.

The second greatest disparity in the subsets was in spiritual influences. South Africans reported a resilience score of 80% versus a U.S. score of 67%. Although some US teacher participants reported that faith communities provided food for students, neither group identified personal support or resources coming from faith communities during their ERT experiences. This lack of identification of spiritual influences by either group makes it difficult to explain the reason behind this disparity. Nonetheless, with regard to spirituality, extant literature shows that 85% of the South African population is believed to be religious (United States Department of State, 2018). The faith that many South Africans have may give them a feeling of hope and hence a sense of resilience when challenging situations arise.

In the area of personal competencies and persistence, the South African reported their resilience at 84% versus the US at 82%. Except for one participant, all South African participants rated themselves at 84% or above. In the US, only three of the five participants rated themselves at that level of resilience, with the US reporting down to 73%. Both groups of participants identified that prior experiences and personal belief systems were important factors in their ability to be successful during ERT. However, only the South African participants identified the importance of personal traits in their success and the ability to "think on their feet" and "learn on their own." This identification of the importance of personal traits by South African participants in dealing with ERT despite greater

challenges may be one reason their resilience score was higher in this area.

Family cohesion was one of two subsets in which the US participants (87%) reported a higher resilience score than their South African counterparts (81%). Although both groups reported that family members provided support during the ERT, the US participants were more specific about who provided the support. They mentioned spouses and other family members as sharing more the family responsibilities. This may indicate that there was a more cohesive family commitment to supporting teachers during ERT in the US. This would connect back to the literature on the cultural role of women in South Africa. During the COVID-19 lockdown, domestic responsibilities, including caring for the sick, would be amplified. During this study, the South African teachers and families will not have been vaccinated with minimal to no vaccine utilization infrastructure (Eccleston-Turner et al., 2021).

The second subset in which US participants reported greater resilience was in peer support. US participants reported a resilience score of 78%, and the South African participants were similar at 75%. Both groups identified other educators, subject matter experts, and their peers as support systems during ERT. This general agreement on the types of support received from their peers could explain the similar levels of resilience.

## Limitations and Future Research

A small convenience sample of teachers from South Africa and the United States were interviewed for purposes of this study. Therefore, these findings provide a snapshot of that small sample of teachers from two countries and cannot be generalized to all teachers from those countries or developed and developing. However, the findings of this study will be of great interest to researchers in other locations with diverse populations. Finally, only teachers working with students 11–18 years were participants in this study. The results uncovered three gaps in the research as future research should: 1.) have a wider variety of developed and developing countries; 2.) include grade levels under the age of 11 years old; 3.) determine strategies for supporting teacher resilience for the factors identified in this study. Future researchers will be able to use the SETI framework is a framework for the integration of technology in a wide variety of settings, disciplines, and grade levels. TPACK and SAMR are frameworks widely used, however, SETI is the first framework that encompasses the whole range of factors that determine the choices and ability for the educator to integrate technology. These factors go beyond having technology, to the many other factors including the policies, training, technology support, cultural and societal technology norms, and educator beliefs.

# Conclusion

This study was conducted to better understand teacher resilience during ERT during the COVID-19 pandemic. This study provides unique data on teacher resilience levels during a longitudinal emergency, while conducting ERT with technology for learning. Furthermore, this appears to be the first empirical work comparing COVID-19 teacher experiences across a developed and a developing country. Data from this unique study indicates that teachers from South Africa and the US were both able to maintain high levels of resilience during ERT. However, one major finding is that the teachers in South Africa reported less support and resources and greater challenges, yet overall reported themselves as more resilient than teachers in the US. During this work, the SETI framework was developed to be used to examine teacher technology integration across social and ecological spaces. In analyzing the responses to a priori questions based on the SETI framework, six factors emerged that impacted teachers' experiences during ERT: self-efficacy, growth, motivation, resources, support, and teacher challenges.

The factor influencing resilience that generated the most robust responses from the interview questions was teacher challenges. There appeared to be an almost unanimous consensus among teachers in both countries on the major challenges: time management, student issues, isolation, anxiety, meeting student needs, technology, and student engagement. This almost overwhelming consensus by teachers in both countries of the challenges they faced during ERT provides researchers with a common set of issues to investigate regarding how to assist teachers during ERT. The COVID-19 pandemic was the most unique global challenge to educators in recorded history (UNESCO, 2020). This study provides insight into teacher resilience with ERT in the COVID-19 pandemic. In addition, it provides insight into the needed support structure surrounding teachers, the areas in which they struggled, and suggested future research avenues for teaching during future emergencies.

# Appendix 1

### Semi Structured Interview Questions
Educator

- On a scale of 1–10, how would you rate your proficiency using technology to teach on-line before you went remote? One being no proficiency at all and ten being very proficient.

- What things in your personal life enabled you to teach online?
- What support did you receive from your family that helped you to teach online?
- What challenges existed in your personal and family life that impacted your ability to teach online?
- What anxieties and fears did you have when you had to depend on technology to teach online?
- What motivated you to be successful in teaching online?
- How did your understanding and knowledge about the use of technology change or grow during the time you were teaching online?
- From a personal perspective, what was the biggest challenge you encountered during teaching online?

School- Microsystem

- How did your individual school support your teaching online? With regards to gadgets, connectivity, technical support, training. etc.
- Who did you turn to when you had technical difficulties teaching online?
- From a school-level perspective, what was the biggest challenge you encountered during teaching online?
- What were the biggest challenges your students faced learning online? How did you address these challenges? How did the school assist you in this regard?

District-Exosystem

- How did your school district support your teaching online? With regards to gadgets, connectivity, technical support, training. etc.
- How did your curriculum and subject advisors help when moving to online teaching? (Did they help?)
- From a district-level perspective, what was the biggest challenge you encountered during teaching online?
- How did the local community support your teaching online? With regards to gadgets, connectivity, technical support, training. etc.

National- Macrosystem

- Nationally, what are thoughts about learning online?— Are they generally positive or negative beliefs?
- How did regional/national organizations support your teaching on-line?
- How did the network providers in your region support your teaching online?
- What role did the national Department of Education played in enabling your effective teaching online?

### Other

- What else do you think we need to know to better understand your experience of having to teach online with little or no notice and preparation?

**Declarations**

This study was passed by Old Dominion University's Review Board. The ethical guidelines were followed to ensure that data was anonymized to protect the identity of the participants.
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**Conflict of Interest** There is no conflict of interest.

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