Reconceptualization of Remote Teaching and its Affordances:

A Case Study of Township Secondary Schools in Gauteng

by

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ABSTRACT

Due to the abrupt transition from face-to-face to online instruction imposed by the Covid-19 lockdown, teachers were forced to employ a method with which they were unfamiliar. This method was named the ERT. The majority of teachers were caught off guard by using a system for which they had not received adequate training to effectively teach learners. As a result, the ERT strategy caused more some apprehension amongst the teachers, thus the educational system must rethink the cited method. Now that teachers are expected to employ a variety and overabundance of digital technology tools, yet many have little or no experience with using them, and this hinders their capacity to effectively deliver their lessons during the learning and teaching process.

This study aims to explore teachers' perspectives of ERT as a future alternative instructional mode that produces high- quality education and desirable outcomes. It also emphasises the need for teachers to receive continual professional development in the digital technology domain as it evolves. The study used a case study design of teachers who taught in the townships and applied qualitative research methods. Six participants took part in the in the study, which used a qualitative method approach. Data was collected through semi- structured interviews which were followed by thematic analysis. The findings of the study indicate that secondary school teachers maintained that the ERT method of teaching should continue to be used in classroom practice and reimagined as a different possible method for teaching with digital technology. Teachers also recommended that they continue to receive professional training in the field of digital technology as it advances to ensure that ERT is elevated to new levels.

Keywords: Digital technology, Emergency Research Teaching (ERT), instructional design, professional training, reconceptualization.

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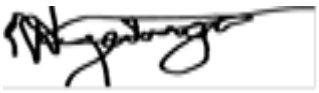
Thank you all.

DECLARATION

I, NOMATHEMBA NYALUNGA, declare that this research report is my own unaided work. It is submitted for the degree of Master of Education at the university of Witwatersrand, Johannesburg. It has never been submitted to any other university for any other degree or examination.

Signature:  Date: 9 May 2023.

DEDICATION

This is especially for my son, who motivates me to work at my best ability and has always been an inspiration to me.

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Abbreviations

ERT – emergency remote teaching

GDE – Gauteng Department of Education

ICT – Information and Communication Technology

LMS – learning management systems.

SRL- Self Regulated Learning

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CHAPTER 1: BACKGROUND OF THE STUDY

1.1 Introduction

The outbreak of COVID-19 pandemic globally forced schools to migrate much of their teaching, learning and assessments into digital and other platforms. While efforts were being made to reconceptualise teaching, learning and assessment in blended learning environments prior to the COVID-19, the pandemic forced teachers into emergency remote teaching (ERT) methods to continue with their academic programmes to save its integrity and its institutional obligations of quality education.

South African Government shutdown the country in March 2020 due to covid-19, meaning that the school-teaching calendar was interrupted and disrupted. The effect of the lockdown speeded up the digital revolution which called for the implementation of Emergency Remote Learning. ERT is a temporary solution to an immediate problem in this due to Covid-19 (Ferri *et al*., 2020, p. 3). It is true that this remote learning method is a creative and temporary solution that should keep education at large going. It is sometimes confused with online distance education, though they sound alike, they are not in the same equation. ERT is a temporary shift of instructional delivery of an alternate delivery mode due to crisis circumstances. “It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated” (Hodges, Moore, Lockee, Trust, & Bond, 2020, p. 6).

Many teachers' working lives have been consumed by the urgency of efficiently converting to an ERT form of teaching and learning during the same months. Indeed, it was a lesson learnt as teachers, had no choice but to choose a pathway that would not affect their ability in instructional pedagogy. During lockdown, some academics have found that combining video conferencing tools like Microsoft Teams with social media platforms like WhatsApp has been a good ERT communication technique. Teachers undoubtedly had the opportunity to explore the potential for ERT instruction (Mahaye, 2020).

The primary objective in these circumstances is not to re-create a robust educational ecosystem 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 or crisis. When ERT is understood, it could be seen clearly that it is divorced from "online learning." Thus, this study focuses on the affordances that come with remote learning especially to mainly disadvantaged township schools. “Affordance”

concepts used to describe how attributes of online technologies interact with the other elements of a learning context, including learners, teachers, and the physical environment (Llyod and Day, 2007).

Despite the uneven terrain access to ICT infrastructures among schools, instructors, and students alike, this research tries to stress on the opportunities and affordances that arrived with ERT. ERT was intended to be a short-term measure to facilitate continuous learning through the use of digital platforms; however, the research views ERT as a continuous teaching and learning procedure that should not be stopped but should be expanded in this society already saturated with digital technology (Costley, 2014). Therefore, ERT must be reconceived as a different approach to teaching employing digital skills (that can almost be equated to online learning). Social issues arise from the absence of connection between teachers and students as well as from the latter group's inability to access digital resources at home and at school. A new strategy to integrating digitally infused teaching and learning should be adopted permanently and continually revised to meet the demands of the constantly changing environment, based on the lessons acquired from this global disaster (Ferri, Grifoni, & Guzzo, Tiziana, 2020).

1.2 Problem statement

The sudden shift from face-to-face to online teaching due to covid-19 left teachers with limited teaching options, teachers were compelled to implement a method that they were not familiar with. The majority of teachers were caught unprepared, as they knew little about how to effectively teach learners using technology. Since the sudden shift to technology supported pedagogy caused more confusion than justice, it became clear that the education system needed to reassess the teaching and learning process. The need for training came to the fore because teachers became exposed to a wide variety of digital technology tools that they have limited knowledge of how to use them, which interferes with their ability to teach. In addition, there is inequality in terms of accessing digital resources to use during the learning and teaching process. This is because it is preferable that learners use similar resources to facilitate effective teaching and learning.

A brief look at the prevailing status and availability patterns of ICT infrastructure in South African schools reveals that Gauteng province has the highest number of schools with computers at 88 percent (Dube et al., 2018). However, teachers are faced with several technological and pedagogical challenges attributed to access to infrastructure such as technological devices and unreliability of

Internet connections. Also, in existence is the challenge of teachers at large lacking digital skills and how to structure content in amidst abundant online resources (Ferri et al., 2020).

Using technology to intensify teaching and curriculum coverage is a step in the right direction, however, the situation must be socially just to ensure fair access and distribution of learning resources across communities, especially among historically disadvantaged groups (Dlamini and Ndzinisa, 2020). The government must offer continual support such as training for teachers and learners, well as provide IT specialists who can provide immediate help to maintain the systems.

Despite these cited challenges, teachers should re-think of opportunities ERT offers in improving quality of teaching and learning for future instructional pedagogy rather than seeing it as a temporary measure. This teaching mode can work equally the same as online teaching. The teaching materials happen at real-time and learning materials are uploaded in advance on a formalised learning management system (LMS), such as Moodle, Canvas and Blackboard just to mention a few, if they exist in the school. However, it can also be used asynchronously where teaching materials are pre-recorded on PowerPoint slides and shared with learners.

1.3 Research Aim

The aim of this research is to persuade teachers to rethink utilizing ERT as a future instructional mode option that results in high-quality education and desired outcomes. During the recontextualized ERT, teachers maintain inclusion of the heterogeneous (diverse) learner's environment throughout their teaching practice. For teaching and learning, teachers may want to consider utilizing easily accessible digital resources like students' smartphones. Nearly every high school student in South Africa has a cell phone. As a result, teachers may communicate/connect with students via WhatsApp social media platform. Teachers should continually get professional training in the field of digital technology as it develops in order to ensure that ERT is brought to new heights.

1.4 The main research question

The study addresses the main question:

How should teachers view ERT as a potential future teaching/instructional mode that can generate high-quality instruction and desired educational outcomes?

1.4.1 Sub-questions

1. How do teachers place ERT as a possible future teaching opportunity for pedagogical instructions?

2. What teaching strategy should teachers preserve during ERT to cater diverse learner needs?
3. What technological pedagogical abilities do teachers need to adopt ERT as a future acceptable way of content delivery?

1.5 The significance of the study

Initially, ERT was a stop gap measure/method that facilitated learning during an emergency. This study advocates that this mechanism must continue as alternative technological pedagogy, an approach favoured by contemporary education. ERT is envisioned to transform ERT into an acceptable teaching delivery mode that promotes learner engagement and quality teaching. In addition, for this approach to effective, teachers need to be continually re- skilled with the use of digital tools in remote teaching environments as technology continues to progress. Furthermore, online learning has enabled teaching and learning to continue uninterrupted, despite the crisis brought on by COVID-19 (Mahyoob, 2020). However, a systematic strategy to closing the loopholes and gaining a better knowledge of the affordances associated with ERT is required to support the effective implementation of ERT as an alternative and legitimate instructional mode that takes into consideration the diversity of learners and inclusivity. In this era where there are technology disruptions, the department of education need to harness a method of teaching that uses technology as the majority of learners are already 'digital citizens', meaning there are born within technology and thus understand digital instruction better than tradition one (characterized by chalk and talk).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section outlined what other experts have discovered regarding ERT and its effectiveness. Additionally, the research will examine the possibilities of online teaching andthe affordances that are being developed. Further, it will analyse how ERT has been implemented in other nations and will be filtered down to South Africa.

2.2 Conceptualisation of ERT

The realistic approach for teaching and learning that was adopted, was that of ERT which is defined as a temporary shift of instructional delivery to an alternate delivery mode as a response to crisis situations (Barbour *et al.*, 2020). ERT involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses. In addition, CHE (2020), states that "ERT signals the use of a different form of transmission mode than contact classes but also indicates that an online pedagogy has most likely not been fully adopted'' it is still in a temporary stage (p. 4). ERT is based on the understanding that there would be a return to the normal contact-mode teaching and learning once the crisis is under control, and a safe return to classes possible. The primary objective of ERT is not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional support in a manner that is quick to set up and is reliably available during an emergency or crisis (Barbour *et al*., 2020).

Rather than viewing ERT as a temporary solution, this study aims to advance ERT as a form of instruction to a level that can transition teachers' psychological minds from temporary to permanent or as another form of lesson instructional delivery. Moving instruction to online via ERT allows for greater flexibility in teaching and learning anywhere and at any time (Hodges *et al*., 2020). The rate at which the transition to online education is occurring is unparalleled. Teachers do not appear to be given enough time to learn how to teach online. Thus, the purpose of this research is to devise a method for making ERT a pleasurable practice for teachers while also removing uncertainties and hesitations.

Trust and Whale (2020), states that studies are necessary to determine the distinctions between ERT and blended or online education because in an ERT setting, learners may experience anxiety, due to the lack of preparations for an example, supplies of appropriate digital technology the typical

classroom (such as food, IEP providers, and supports) (p. 6). Access to reliable electricity, modern technology, or the Internet are all challenges for other learners especially in undeveloped areas. Furthermore, several factors might significantly affect a teacher's ability to assist learners using technology. Comparing ERT, blended learning, and online learning may assist researchers and teacher educators develop professional development programs that can improve teachers' assessments of teachers' level of preparedness to teach in any situation in the future (Trust and Whalen, 2020).

2.3 Definition of Emergency Remote Teaching

According to Hodges *et al*. (2020) ERT is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances, teaching temporary moves from face-to-face to online learning. It entails using totally remote teaching solutions for instruction or education that would typically be offered in person, through blended learning, or as hybrid courses, and that will switch back to that format once the crisis or emergency has passed, further more Affouneh *et al*. (2020) stated that ERT, encompasses a sudden switch from traditional to remote instruction in response to emergencies like the global Coronavirus outbreak, is typically not planned in advance (p. 2).

2.4 The difference between ERT, Online and Distance Learning

According to Ferri *et al*. (2020), online learning can be defined as instruction delivered on a digital device that is intended to support learning. Significant benefits of online education have been emphasized in the literature, including studying from anywhere at any time; potential for large financial savings; absence of commute on crowded buses or local trains; flexibility to pick; and time savings, which shares the similar characteristics with ERT, Hodges *et al*. (2020), additionally explains the ERT as a use of online learning in an emergency situation, it has also inspired experts, policymakers, citizens, teachers, and learners to look at it as an alternative teaching method. As a result, the idea of online learning is giving way to the concept of ERT, which denotes "a temporary shift of instructional delivery to an alternate delivery medium due to crisis circumstances."

ERT should not be confused with online teaching and learning because the two methodologies are very different. Online teaching and learning is the deliberate creation of online study material in which each step of the design process is examined and analysed to ensure effective teaching and learning (Hodges *et al*., 2020; Knoetze and Du Toit (2022). Under emergency conditions, ERT is the rapid translation of study material prepared for face-to-face instruction into an online delivery modality (Hodges *et al*., 2020). These two modalities differ structurally, according to Knoetze and

Du Toit (2022), since online teaching and learning use regular interactive online tools and activities such as online quizzes, polls, and self-assessment approaches (p. 2). In contrast, small changes are made when looking at ERT. Minor changes are made to face-to-face information before it is made available online. Furthermore, students choose this style of study in an online setting, whereas students in an ERT setting are forced to adopt this mode of study. As a result, the rapid adoption of face-to-face material for ERT purposes frequently leads in a decrease in the quality of the instruction offered and the learning imparted (Knoetze and Du Toit, 2022). The table that differentiates between online and distance learning follows below.

Table 1:Difference between Online and Distance Learning

Aspects	Online Learning	Distance Learning
Location	Learners can be together in the classroom	learners work online at home
Interaction	In-person interaction	No in-person interaction
Intention	Variety of teaching methods and styles	No variety of teaching methods and styles

2.4.1 Affordances of ERT

The notion of affordances as directly perceivable as an opportunity for action according to Gibson (1977). The verb to afford in affordance is found in the dictionary, but the noun affordance is not. One key moment in this was the popularisation of affordance by Norman (1998). However, Norman (1998) offered a modified view of affordance focusing on an association with suggestibility, in addition the term affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used. A final example in using affordance tailored to pedagogical design is offered by Conole and Dyke (2004). This is a more speculative paper which relates affordances in technology to features of "our late modern age". Through this lens taxonomy of ICT affordances is created including accessibility, speed of change, diversity, communication, reflection, and multimodality (Lloyd and Day, 2007).

Other research has shown that effective online teaching and learning is hinged on careful planning and instructional design, using a systematic model for design and development (Hodges *et al*., 2020). The predominant part of ERT is that it involves the use of fully remote teaching solutions for instruction. ERT allows re-creating a robust educational ecosystem. Learning can take place 24 hours a day and is seamless of the classroom. Learners could continue with their learning activities while outside their classrooms (Hodges, Moore, Lockee, Trust, & Bond, 2020). This is the beauty that

comes with the use of technology as learners are no longer restricted to their classroom to be taught. Moreover, learners are taught anywhere anytime as long as they have access to information technology gadgets (Bozkurt and Sharma, 2020).

2.4.2 Learning Management Systems (LMSs)

South African schools replaced face-to-face teaching and adopted the ERT approach. A Learning Management System is a software application that manages educational courses, training programs or learning and development programs, through administration, documentation, tracking, reporting, automation, and delivery (Bradley 2021). LMS became central to the implementation as it allows learners to participate in virtual communities and allow learners the opportunity to take ownership of their own learning in ways not constrained time and space (Barbour *et al*., 2020). In addition, globally universities institutionalized digital technologies to enable learning beyond the walls of the classroom using LMS (Dlamini and Ndzinisa, 2020). The basic education adopted the LMS to continue with tuition, using learning system like Canvas and Moodle during covid-19 lockdown for teaching and learning to continue whiles traditional classroom learning was on pause. According to K-12 Blueprint (2014), "A learning management system (LMS) is an online platform that enables the delivery of materials, resources, tools, and activities to students both in and out of the classroom environment. It allows teachers to offer tailored instruction that can be accessed by students anytime, anywhere without geographic constraints" (p. 2). During lock down LMS was vastly used by both basic education and higher education.

2.4.3 Approaches used for ERT

Figure 1 displays approaches employed for ERT, which included asynchronous pre-recorded class videos and recordings, WhatsApp voice notes, and voiceover PowerPoint, along with synchronous interactions taking place in virtual classrooms. Pre-recorded videos and virtual classes that were also taped were the most common approaches for ERT. The primary motives for pre-recorded movies or recording courses were to provide access to learners who would otherwise miss classes due to several factors such as an unstable network, insufficient data for connectivity, and family obligations, among others (Matarirano *et al*.,2021). Figure 1.1 below, displays the approaches used during ERT.

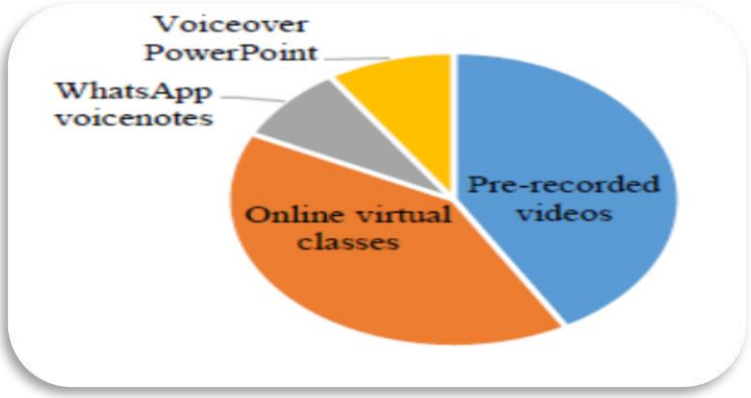

Figure 1:Approaches employed for ERT Source: Matarirano et al., (2021)

Many schools have implemented learning management systems to help with assessment and assignments, such as Canvas, Google Classroom, and D6 for collecting and grading assignments. According to Matarirano *et al*. (2021), during lockdown it was considered that many learners may have needed delayed and postponed completion of tasks due to personal circumstances and challenges associated with digital technology. As a result, teachers had to reconsider alternative methods such as ERT approaches for learners to continue with the process of learning. On the other hand, Centre for Research on Learning and Technology (CRLT) provided resources and online training on several assessment methods. schools used the methos such LMS to administer exams. According to Matarirano *et al*. (2021), teachers are willing to continue using ERT, the only challenge is that they require extensive training to lower the pressure of preparing lessons.

2.5 Factors contributing towards the adoption of ERT, as an official teaching method.

Despite prior research findings to the contrary, there is a widespread perception that online 3learning is of lower quality teaching method than face-to-face learning. While transitioning to online teaching under limiting conditions is ineffective because it does not allow teachers to design pedagogical lessons that fully take advantage of the affordances and possibilities of the online teaching method. The hurried move to online learning due to covid-19 lockdown has led to the perception that online learning is a limiting option teaching method (Hodges *et al*., 2020).

Before any online program can succeed, learners must be able to access the online learning environment. Lack of access, whether to financial or technological digitals, will prevent learners from receiving quality teaching which leads to the perception that online learning is not effective. Thus, connectivity is a major issue in rural and low-income areas. on the other hand, if learners cannot

afford the technological digitals utilised in schools, learners will not be able to learn at the same rate (Chirinda *et al*., 2021). In contrast to the general belief that online learning is not as effective as classroom learning, Dube et al. (2018) are of the believes that if a teacher creates a well-organized online program in which the majority of learners have access to the resources required to access learning materials, online learning provides extensive in-depth information and is as effective as in-person teaching.

2.6 Challenges associated with ERT

In South Africa schools were closed because of decision made by the government during the Covid-19 pandemic. Because of that, teachers had to deliver lessons in an online environment, where they create courses, homework's, assignments, and assessments that are appropriate for online learning. A significant adjustment in practice was required of many teachers who claimed to have had little or no digital technological training. In most instances change is often implemented in baby steps, examining what works and what doesn't. However, the Covid-19 pandemic response's rapidity has precluded taking a calm and steady approach. This presented teachers and learners with numerous difficulties that made it difficult for effective teaching and learning to take place (Costello *et al*., 2021). Several challenges that are discussed below are as follows, Pedagogical issues; Technical support; Class sizes; and academic performance.

2.6.1 Pedagogical issues

Online teaching was implemented as ERT. However, it was not properly rolled out, as many teachers were technologically incapacitated. Teachers faced mammoth challenges when trying to teach using online teaching method and it affected the quality of their teaching. Most learners were disadvantaged as the quality of the lesson delivery was below the standard compared to face-to-face instructions. The limited training hinders effective content delivery. Teachers might not have access to adequate facilities and online resources to carry out the lessons. They might also face difficulties due to the limited technological knowledge to utilise online educational technologies properly. Moreover, these challenges affect teachers' readiness, which in turn affect the effectiveness of the learners' learning process (Lynch *et al*., 2017).

According to Saavedra (2020), there is no magic formula to put things right, hence it is a well-known reality that the one-size-fits-all understanding no longer works. Before implementing techniques, we must consider several elements, such as target group, age range, technology infrastructure, and social and economic context. It has been argued that wealthy countries have an advantage when it comes to commencing

ERT, however this is not relevant for all countries.

However, because going online swiftly in an emergency limits testing time, teachers are more likely to rely on what they already know and the tools they had in place before to the crisis (Dill *et al*., 2020). The transition to online learning is typically made voluntarily by the teaching staff with assistance from support staff. It is a process that requires both time and resources, that is, human, intellectual, and technological digitals. It is estimated that it will take between six and nine months to transition a standard program to online instruction, including planning, preparation, and development. With ERT there was limited or no time to prepare since it is implemented in an emergency situation (Hodges *et al*., 2020).

Research studies of Callum *et al*. (2014), p. 150; Mooeketsi and Chigona (2014), p. 7; Ndlovu and Lawrence (2012), p. 5, indicate that teachers are either under-utilising ICT or not implementing ICTs at all in their teaching practice and provided reasons why teachers are reluctant to use ICT. Similar findings are expressed by Sipilä *et al*. (2014) regarding ICT use in Finnish schools where he maintains ICT adoption and use of digital technology in teaching and learning. He added by indicating that most schools use ICT, and it is still being developed, most teachers can plan and effectively teach using ICT. However, schools that lack ICT policies and vision, or have teachers with insufficient ICT skills, and the school leadership which lacks vision in terms of ICT and its usefulness in education implementation would not be successful. Furthermore, in-service training is essential for teachers because it boosts their confidence.

2.6.2 Technical Support

According to Jamieson *et al*. (2013), teachers utilise computers for a short period of time if there is no technical support or maintenance performed on it. As it results to teachers becoming discouraged. When it comes to black schools, Mooketsi and Chigona (2014) noted that "the idea of providing all schools and every learner with a tablet as well as educational software will remain a utopia, given the economic background and conditions of learners in township and rural areas. Conditions which are lack of resources and ICT skills for educators that has prevented the integration of ICT usage in urban and rural schools" (p. 7).

According to Jamieson *et al*. (2013), technical challenges in schools have become a major concern and source of irritation for both students and teachers, causing pauses in the teaching and learning process. Additionally, Teachers require assistance and support in maintaining digital tools since ERT necessitates the use of a variety of digital tools with varying functionalities to assist teachers in balancing their tasks. Teachers are expected to make decisions about teaching and learning that

include the use of asynchronous tools like content management systems, message boards, email, pre-recorded videos of teaching sessions or synchronous chat, videoconferencing or real-time collaboration systems, instant messaging-tools, and even changes to assessment activities or assessment criteria.

Continuation development of teachers is empirical to ensure effective teaching through digital tools takes place. In agreement with Jamieson *et al*. (2013), It becomes exceedingly challenging for successful implementation of remote teaching to take place in low socioeconomic status communities, where there is limited access to digital tools and still a lot of unreliable or no internet connectivity. Educators in quintiles 1, 2, and 3 are disproportionately excluded from ICT infrastructure and technical support. As a result, this calls on governments and international organizations to help equalize access to computing infrastructure among instructors in order to enable a smooth ERT transaction (Dewa & Dlamini, 2021, p. 14).

Technical support is essential for both teachers and learners, assisting them in reducing work frustrations. There should be technologists readily available, particularly in schools, to assist with adapting to new learning environments as it is challenging, additionally, when difficulties develop, having a professional on hand to assist is ideal. besides that, common technical issues that may arise during online remote learning. As aim of ERT to avoid learners falling behind with their studies.

2.6.3 Class sizes

Within each of these dimensions of social and economic factors, they are complicated matters, not all the options of instructional modes are equally effective. For example, decisions around class size greatly constrain what strategies you can use. Practice and feedback, for example, are well established in the literature, but it's harder to implement this as class size grows, eventually reaching a point where it's just not possible for an instructor to provide quality feedback, the class size greatly contributes to the effectiveness of teaching to take place (Hodges *et al*., 2020).

In addition, Hodges *et al*. (2020) indicated that when teachers decide in the case of synchronization, it will largely depend on the traits and demands of your learners. Adult learners tend to require more flexibility, so asynchronous is usually best, perhaps with optional synchronous sessions, whereas younger learners benefit from the structure of required synchronous sessions. One of the more extensive areas of study in online learning focuses on various types of interaction, such as learner-content, learner-learner, and teacher-learner interactions. In essence, it demonstrates that each of these interactions contributes to ERT in a meaningful way. It is critical in remote learning to have a reasonable teacher-learner ratio so that a teacher can monitor and regulate all his learners. During the

Covid-19 lockdown in South Africa, it was difficult for teachers with inadequate resources to successfully teach remotely, thus learners from economically challenged backgrounds were unable to attend online sessions (Ndlovu, 2012).

2.6.4 Academic performance

This study aims to investigate how ERT can be adopted as one of the official instructional modes, in prior research related to academic performance between face-to-face and online learning as one of the pedagogical issues, keeping in mind the fundamental difference between ERT and online learning described in the introductory section as well as the similar elements of decision when moving teaching to the online space. For some time, a major focus of educational research has been the research of how face-to-face, blended, and online learning affect students' final grades. According to Milz (2020), face-to-face training outperforms online learning in terms of learner performance (p. 17). Performance difference between online and in-person learning is minor, which agrees with Cavanaugh and Jacquemin (2015). However, the findings of the study Garcia *et al*. (2021) appear to agree that as the number of courses under consideration increases, learners achieve greater marks in online learning than in face-to-face instruction (p. 2).

In addition, Knoetze and Du Toit (2022) mentions that learners demonstrate poorer SRL tactics in ERT than in face-to-face teaching and learning, consistent with their and the teachers' perspectives (p. 6). Learners that use poor SRL methods are more likely to fall behind and disengage in their studies because they are unmotivated. Learner falling behind directly influence academic performance, procrastinate more, feel alone, and struggle to manage their time and study environment. It was expected that determining whether students are more likely to fall behind in ERT will reveal whether their perception of SRL in an ERT context is reflected in their behaviour (Knoetze and Du Toit, 2022).

On the other hand, Knoetze and Du Toit (2022) respond to Sangster *et al*. (2020).'s appeal to research the influence of ERT on learner involvement. According to the study findings, learners in an ERT setting display lower SRL by falling further behind and consequently withdrawing in their study program as opposed to a face-to-face situation. Previous research, on the other hand, has found that poor SRL is associated with lower academic attainment (Broadbent and Poon 2015; Beattie *et al*., 2019). The findings given by Knoetze and Du Toit (2022) revealed that learners were more likely to fall behind during ERT than during face-to-face teaching and learning, and that the difference was statistically significant across all modules studied (p. 18). According to the research of Knoetze and Du Toit (2022), it is crucial to address self-regulation problems on ERT because inadequate SRL has

been associated to worse academic attainment. The data show that students are more likely to fall behind via ERT than during face-to-face teaching and learning, resulting in lower SRL (p. 1).

Furthermore, learning assistance management, often known as help-seeking skills, requires learners to seek assistance in order to improve their own learning (Fadda, 2019; Lynch and Dembo, 2004). According to Knoetze and Du Toit (2022), there is a substantial positive link between help-seeking and academic attainment (p. 5). According to learners' impressions of ERT, the inability to ask questions during and after class, as well as the lack of a relationship with the instructor, are major disadvantages of ERT. When a learner is unable to ask questions or there is a lack of a learner-instructor relationship, learners do not reach out when they require assistance (Shim and Lee, 2020; Knoetze and Du Toit, 2022).

2.7 Equitable access to remote learning

What remains unsolved is fair and equal access to online platforms during the COVID-19 pandemic, particularly in rural and isolated areas. According to Dlamini (2020), connectivity issues in rural and impoverished regions remain unaddressed. As a result, connection and consistent electricity are the most pressing issues for students and professors in rural and remote places (p. 10). As a result of this circumstance, students began learning online without sufficient preparation, and their access to digital learning tools to access remote learning is limited, preventing them from meeting their learning objectives. The situation is similarly to South African township schools as some are experiencing poor network connectivity and limiting ICT infrastructure. Moreover, Jamieson *et al*. (2013), found in schools technical difficulties sought to become a major problem and a source of frustration for both students and teachers and cause interruptions in teaching and learning process.

COVID-19 in South Africa put a strain on teachers and learners, particularly those from disadvantaged backgrounds. One believes that learners must become more self-regulating, especially when using asynchronous systems like as ERT. According to Fogarty (2020) "The ability to access study materials at any time can easily become the ability to access them at any time," (p. 568). During ERT, learners have indicated that they struggle with numerous aspects of self-regulated learning (SRL), including time management, study environment management, and motivation (Fadda, 2019; Shim and Lee, 2020; Ontong and Mbonambi, 2021; Knoetze and Du Toit, 2022).

Furthermore, this is especially difficult in Africa, which is largely made up of underdeveloped countries, where learners experience interrupted electricity supply, "loadshedding", while other places in South Africa confront electricity load reduction and limited access to technology and

resources (Mittelmeier *et al*., 2019; Ontong and Mbonambi, 2021; Knoetze and Du Toit, 2022). The study environment management difficulty, like the other SRL challenges, has been emphasized in both online teaching and learning and ERT contexts (Shim and Lee, 2020; Ontong and Mbonambi, 2021). Due to the swift shift to ERT, there was not enough time to prepare, hence if higher education institutions and basic education had planned for a more digital offering in the absence of COVID-19, teachers and policymakers would have begun with the online learning literature and designed pedagogically sound and academically sound processes and procedures to ensure learner engagement and effective learning (Knoetze and Du Toit, 2022).

Furthermore, Jamieson *et al*. (2013) claim that if there is a lack of technical help and no technical upkeep, teachers will be discouraged from delivering classes that require digital technologies. Furthermore, Mooketsi and Chigona (2014) state that "the notion of providing all schools and every learner with a tablet as well as educational software will remain a utopia in black schools given the conditions which are, lack of resources and ICT skills for educators that have prevented effective integration of ICT usage in urban and rural schools" (p. 7).

2.8 Professional development in the use of ICT

In a teacher's career ERT, digital technology training is crucial. Berg *et al*. (2011), discovered that lack of pedagogical education in teacher training programs prevented teachers from embracing ICTs in online environments. Furthermore, while individual ICT talents for personal use may have been great, the challenge was applying these skills to instructional practice, as they underlined in their studies.

According to Ghavifekr *et al*. (2015), education system has altered significantly since the emergence of learning technology in the late twentieth century. This is owing to technology's capacity to create a proactive, easily accessible, and complete teaching and learning environment. Nowadays, Institutions of education all-over the world provides a variety of facilities and training in order to improve the use of advanced technologies in the teaching and learning processes of their respective countries. Additionally Van der Berg *et al*. (2011), highlighted the importance of "curriculum innovations that include teacher training in the use of technology for advances and better performance in teaching and learning in remote environments" (p. 2) .

Garcia *et al*. (2021) state that there are numerous digital technologies that can be employed for ERT, just as there are numerous educational approaches, learning contexts, and learning management systems. Hernández de Menéndez *et al*. (2020), provided a summary of the most recent software

programs to support instructional operations. Moreover, teachers before they incorporate technology into their pedagogical practices, teachers frequently take the time to evaluate the functionality, operation, installation, and usability of the numerous technologies that may be most effective in their classes. However, in this case ERT had to go online immediately without preparations. Emergency remote instruction provides little room for testing (Dill *et al*., 2020). As a result, instructors are more likely to rely on the information and resources they had before to the crisis. Thus, if remote teaching is to be officially acknowledged as a teaching method, continual teacher development programs will be required to keep teachers digitally technological advanced.

2.9 Resistance to adoption of Emergency Remote Teaching

Teaching online poses challenges for teachers trained primarily to work face to face. The COVID-19 pandemic and subsequent lockdown of schools has forced teachers to move online to ensure students continue with their studies (Winter *et al*., 2021). This is not an easy shift, and its success is dependent on teachers possessing the necessary skills, knowledge, and competences for online instruction. Many teachers who report having little or no technological training are facing a significant change in their teaching approach. Change is often implemented in tiny steps, assessing what works and what does not, but the rapid response to the COVID-19 outbreak has precluded a calm and steady approach. In effect, the nature of teachers' work transformed dramatically virtually overnight. It entered uncharted territory with no rules and where much of what works in person may not function online.

Many education systems shifted from face-to-face teaching and learning to ERT and learning ERT in an attempt to save the academic year. South Africa was no exception, with the Department of Higher Education mandating all higher education institutions to offer ERT beginning 1 June 2020. Basic education attempted the shift but due to the uneven terin not all schools were able to adopt ERT. This abrupt move to ERT left many instructors feeling overwhelmed and confused which may resulted many educators' resistance to switch to ERT (Knoetze and Du Toit, 2022).

Teachers' proficiency in using ERT was greatly influenced by their lack of digital technology expertise. Focusing on the time management component, past research has revealed that procrastination is a time management failure, (Klingsieck *et al*., 2012; Knoetze and Du Toit, 2022). Procrastination is common among students even in face-to-face teaching and learning contexts (Rabin *et al*., 2011). Additionally, Michinov *et al*. (2011), discovered that procrastinators were less likely, than non-procrastinators, to excel in an online teaching and learning environment. On the other hand, Elvers *et al*. (2003) discovered that procrastination was negatively associated to motivation

and academic achievement for the online teaching and learning group but not for the face-to-face group when the two groups were compared in the field of ERT research (Knoetze and Du Toit, 2022).

The limited knowledge and training leads to teachers resisting to switch to remote teaching, due to lack of confidence, resulting to no motivation to implement this teaching method (Hodges *et al*., 2020). Additionally, many learners were expected to experience learning loss as a result of the switch to ERT and its short comings. Learner stress, a lack of enthusiasm, and fewer time spent learning are all contributing factors to learning loss further contributed to teachers and learners resisting to use ERT as an alternative learning mode. Less privileged people will likely be more affected by this loss due to their potential lack of access to computers, the internet, and other important technologies. The resistance is caused by fear about the unknown and limited digital technological resources (Dlamini and Ndzinisa, 2020).

Furthermore, the country is experiencing numerous interruptions. ERT will remain relevant in the future for African higher education institutions, especially in light of political unrest and economic volatility (Cilliers, 2018). The African continent is more prone to disruptions in education, so ERT will remain relevant in the future for African higher education institutions. Finally, while it is doubtful that higher education institutions would revert to the pre-COVID-19 model, the findings of this study of Knoetze and Du Toit (2022), identifies the emphasis areas that will need to be addressed in a future hybrid model of teaching and learning (p. 7).

2.10 ERT open new opportunities for education system.

Remote teaching improves students problem-solving abilities, critical thinking abilities, and flexibility. Teachers can use technology and build numerous flexible programs for students to understand better in situations when traditional teaching cannot take place. In a case where face-to-face instruction is not possible due to a crisis, remote instruction is the ideal solution. Users of any age can utilize the online tools and gain the benefits of the time and geographical flexibility associated with online learning since remote teaching offers for flexibility (Dhawan, 2020).

In this time of crisis, ERT has a lot of chances. It will allow online learning to take control, as most academic institutions have shifted to this approach. During the Corona virus outbreak, online learning, remote working, and e-collaborations skyrocketed (Favale *et al*., 2020). Academic institutions can now seize this opportunity by having their teachers teach and students learn online. This catastrophe will usher in a new era of online learning, allowing people to see the positive aspects

of e-learning technologies. According to Dhawan (2020), "this is the moment when there is a lot of possibility in putting out surprise inventions and digital developments (p. 11). The use of ICT will prepare students for the world of work.

In the study done by Chaka (2020), in the review of the response to COVID-19 by United States of America and South African universities, findings state that there are two main types of online tools and resources that have been widely adopted across all institutions: learning management systems (LMS) and video conferencing platforms. Among LMS, canvas and blackboard were the most used online tools in the United States of Americs, and Moodle was predominant in South Africa, which suggests that instructors and the university at a higher level chose to resort to their directly available digital platform to support educational processes in the first place (Macaulay and Dyer, 2010). Regarding video conferencing tools, Zoom stands out as the most used tool, followed by other options with collaborative approaches, such as Blackboard Collaborate, Microsoft Teams or WebEx. Despite the prominence gained by these tools during the pandemic, their use in educational settings is not new, for example, McCoy (2015) reports the use of Zoom by doctoral students.

Furthermore, Trust and Whalen (2020) state that for providers of Inservice teacher training and support, we recommend creating unstructured professional development, such as mentoring or online forums (p. 5), as well as Zweig and Stafford (2016) state that socially connected, learner-centred activities that enable educators to develop knowledge and skills to help them teach with technology in any format or situation, including online, remote, or blended settings. Participants in our study struggled to identify, analyse, and select digital resources for online teaching and communication with students (p. 411). Participants who also struggled with supporting student engagement and perseverance, and this connects with findings related to K-12 online teaching (Zweig and Stafford, 2016). Therefore, Trust and Whalen, (2020) in their paper recommend that teachers explore current literature, including initial results from the Journal of Technology in Teacher Education's COVID-19 special issue as well as research related to blended and online teacher competencies, to identify professional learning topics for supporting teachers' ongoing learning and growth.

In conclusion Emergency Remote teaching has allowed schools to provide learning largely undisrupted during the school closures forced by the COVID-19 pandemic. However, there are several challenges to be faced by teachers which include technological, pedagogical, and social challenges (Macaulay & Dyer, 2010).

2.11 Theoretical Framework

This section represents the course that this study has taken. The main aim of this research is to investigate "elements of ERT" to evaluate the efficacy of teachers' acceptance and reconceptualization of ERT. In addition, according to the ERT framework elements, teachers have the ability to improve online learning in a variety of ways (Alqabbani *et al*., 2021).

The framework outlines that readiness can be determined by having a proper e-learning infrastructure in place and being trained to use learning management systems. Secondly, teacher satisfaction with online experience increases the likelihood that they will use and continue to use high-quality e-learning. Furthermore, analysing teachers attitudes toward e-learning and their judgments of its effectiveness might aid in the planning and advancement of the experience. A conceptual framework (Figure 2) was developed by the researchers Alqabbani *et al*. (2021). The framework includes the following five ERT elements which are; readiness, perceived effectiveness, attitudes, satisfaction, and anxiety. These explain the experience and perceptions of teachers when they use ERT mode of teaching.

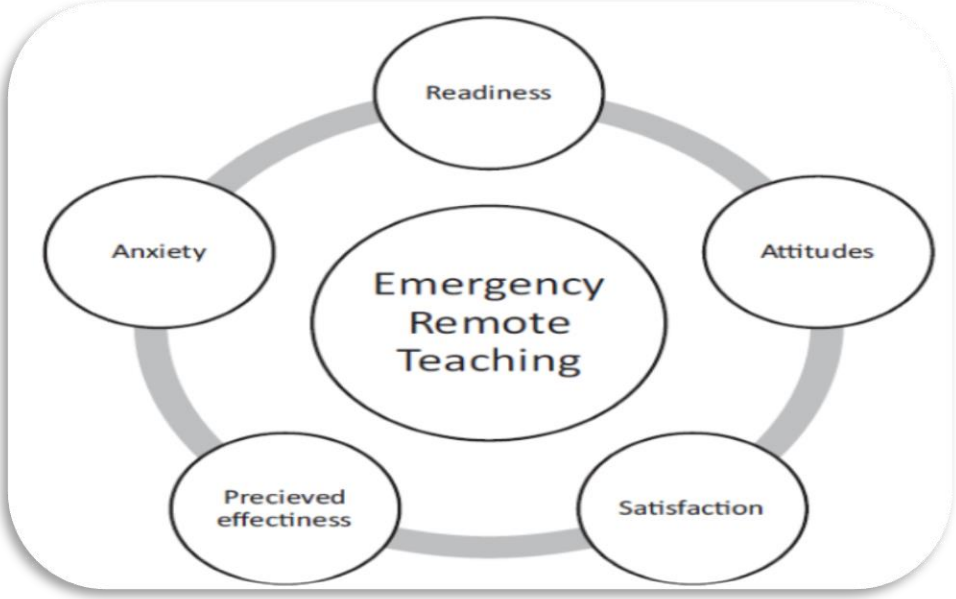

Figure 2: Conceptual framework of elements of emergency remote teaching: Source: Alqabbani et al. (2021).

This framework is relevant to the study since it aims to conceptualize ERT as alternative teaching method rather than a "emergency" medium of instruction. ERT is defined as "a temporary change of instructional delivery to an alternate delivery medium attributable to crisis conditions" (Barbour *et al*., 2020). Hodges and colleagues introduced ERT to separate the nature of remote learning that was imposed during emergencies as an alternative remote learning approach that is aligned with distance learning, blended learning, e-learning, and mobile learning. In this instance, ERT was portrayed as

one of the solutions that assures both social separation and continued instruction for the duration of the lockdown period.

2.11.1 Readiness

According to Alqabbani *et al*. (2021), the hypothesis statement is that "the readier the course teachers' perceptions in terms of effectiveness, satisfaction, and attitudes, and the lower their levels of anxiety during the emergency shift to remote emergency teaching will be" (p. 3). Comprehensive and ongoing ERT training and practices increase the motivation of teachers and learners to learn. However, in order to implement a successful and effective ERT method, proper teaching techniques and instructional preparation must be used to avoid wasting time, technology, and education costs. Even when the situation has passed, teachers should continue to be trained and re-skilled in order to use Remote Learning effectively (Bozkurt and Sharma, 2020; Talidong, 2020).

Teaching online presents difficulties for teachers who have been educated largely to work face to face. The COVID-19 pandemic and accompanying school closures have compelled teachers to go online in order to ensure that learners continue their education. This is not a simple shift, and its success is dependent on educators possessing the necessary skills, knowledge, and competences for online instruction. As a result, many teachers who report having little or no digital technology training face a significant change in their teaching approach (Barbour *et al*., 2020). Additionally, Dewa & Dlamini (2021) expanded an argument beyond the restricted perspective that the integration of ICT in South African schools is hampered by the unequal distribution of computer infrastructure and ICT competence among teachers (P. 1). Despite the increasing number of computers and teachers' laptops in schools, the pedagogical integration of ICT into teaching and learning remains exceptionally slow, especially if teachers are rushed to adopt to ERT without the necessary trainings. These challenges have greatly impacted the integration of ERT, particularly in South Africa's underdeveloped area as a result school readiness especially in township during lock-down was close to none.

Furthermore, the COVID-19 outbreak revealed a wide range of teachers' willingness to embrace digital technology to aid remote learners. Teachers who used technology frequently in their teaching practice, including blended learning, reported an easier transition to ERT for themselves and their learners, consequently, other teachers appeared to be learning ERT strategies and tools while teaching online or remotely; it is more like teachers are building the plane while flying it (Trust and Whalen, 2020).

2.11.2 Anxiety

The rapid response to the COVID-19 outbreak has prohibited a calm and steady approach. The abrupt implementation of ERT changed the nature of teachers' work, which transitioned from teaching to

learning almost overnight. It ventured into uncharted territory with no rules, and much of what works in person may not work online. Teachers had a heavy workload due to a lack of technology digital knowledge and training, which prompted anxiety. Teachers were subsequently apprehensive to change to remote teaching, resulting in a lack of motivation to adopt this teaching method (DeCoito and Estaiteyeh, 2022).

Some of the teachers received hands-on training from institutions and educational departments. As a result, implementing a new teaching technique was a difficult assignment. Teachers were expected to use WhatsApp, email, and phone conversations to teach from the start of the lockdown. However, as the lockdown period lengthened and WhatsApp, email, and phone conversations became insufficient, teachers were forced to transition to a Learning Management System. (Alqabbani *et al*., 2020). The fear of the unknown caused anxiety for both teachers and learners, as they were insufficiently equipped to teach using ICT remotely.

Senior teachers are the ones mostly who experience anxiety when it comes to incorporating digital technology in their lessons due to lack of digital knowledge. According to Dewa and Dlamini (2021), the 21st century has been defined by the introduction of ICT and a shift in global communication brought about by the digital environment. Every government in the globe values ICT growth trends and is actively developing macro policies to offer a framework for information development. This is due to the fact that "ICT has become an inseparable component of life" and a critical instrument for ERT (Hsiang-Jen Meng & Hsiu-Fang Hsieh 2013, p.82), it is critical that educators become technological savvy to stay relevant.

Furthermore, the usage of technology allows individuals such as teachers to free up time to pursue other interests outside of their profession. However, digital technology is also responsible for change in people's lives that are not always appropriate since they disrupt personal and interpersonal connections and even have a negative impact on health. Technology integration may become a source of strain and anxiety among teachers, affecting their daily lives. Despite the absence of technical resources and equipment required for proper pedagogic application, the integration of educational technology is frequently demanded. These situations end in disagreements between teachers, as well as in their interactions with colleagues or other persons involved in the environment, eventually resulting in broken personal and interpersonal connections in the worst-case scenario (Batanero *et al*., 2021).

2.11.3 Satisfaction

When the Lockdown was implemented, and teachers were forced to teach using ERT, teaching transactions took place online without teachers being properly trained to use digital technology tools, specifically web platform such as LMS. Teachers were compatibility concerns with two-way interactions because other learners were returned to their homes, which is in different areas others with no 4G internet connectivity or broadband services and no uninterrupted power supply. There were more complaints from teachers about flexibility than about inequality and diverse contextual backgrounds (Mishra *et al*., 2020, p. 8).

Teaching and learning online is contentious among both instructors and learners because it forces teachers to "adapt to new pedagogical concepts and modalities of delivery of teaching for which they have not been qualified. As a result, teachers did not receive in-service training. Many data suggested that, while the majority of teachers supported the use of technology, the most significant impediment was a lack of training. Many teachers had minimal experience utilizing technology to teach literacy. According to studies, teachers require training to successfully integrate technology. Technology is a crucial tool in the classroom when used properly; therefore, instructors must understand when and how to use it. Teachers' lack of technical competency and adaptability, as well as a lack of training, reduce motivation and satisfaction to the online teaching practice (Winter *et al*., 2021).

2.11.4 Perceived effectiveness

Mishra *et al*. (2020) indicates that “Teachers unanimously opined that orientation programmes and workshops were found useful to get along the newest modes of usable online teaching-learning” (p. 7). Moreover, the Department of Education and teachers uploaded readable content handouts, and others gave full reference books, for reading. Preparation of handouts required extra work which some teachers were not ready to do.

Individual course grades were assigned at the discretion of teachers. Mishra et al. (2020) argues that "whether remote teaching can be effective in the future or not" is questionable. Additionally, they noted that it has been helpful in evaluating learners' performance for the time being. Moreover, because this country's online teaching-learning mode is still in its infancy, failure to understand the individual differences of pupils may result in biased judgments. Thus, teachers are eager to employ ERT; the only impediment to its implementation is teacher training.

Teachers' reluctance to use ERT is directly related to a lack of teacher training and technical support in schools resulting ineffective teaching and learning. According to Dewa and Dlamini (2021), the phenomena is based on instructors' inadequate prior ICT experience and epistemological knowledge, which attributes to social and cultural assets. There is widespread consensus that for successful ICT

integration, teachers must be technologically knowledgeable and members of professional groups in order to employ best practices for pedagogical ICT integration in the classroom (Clarke & Zagarell 2012; Jordan 2011; Dewa & Dlamini 2021).

Remote learning lessons incorporates multimedia content, allowing teachers to use more material than in typical face-to-face classes. Learners learn at their own speed because remote lessons give them complete control over their studies. In remote learning, learners tend to work faster and assimilate more digital material than they would in the traditional classroom. They could learn far more effective if the teacher designed a lesson well. ERT requires a teacher to be assertive.

2.11.5 Attitude

In terms of learner perceptions of remote teaching-learning, they claim that the online learning process during COVID-19 enabled them to stay in touch with their lessons outside of the four walls of the classroom, preventing crowding and creating an alternative teaching method for completing the syllabus. However, other learners reported a lack of interest and focus during online classes because they were not used to learning on cell phones and computers, since there was no training provided prior to implementation of ERT, which proved to be a huge setback for teachers and learners. As a result, they believed that learning digital technical abilities beforehand was critical (Mishra *et al*., 2020).

According to Mishra *et al*. (2020), their study suggests, that the online learning process during COVID-19 enabled learners and teachers to stay in contact with their teachings outside of the four walls of the classroom preventing crowding in the classroom and creating an option for completing the syllabus. However, because they were not used to learning with cell phones and computers, and no prior training was provided, numerous learners reported a lack of interest and concentration during online lessons, which proved to be a great disadvantage for them. As a result, they considered that developing digital technical abilities as early as possible was vital.

Teachers in low-income societies who rarely uses technology in the study have lower levels of skill with a wide range of programs and applications. However, there are still a significant number of teachers who lack confidence, who are apprehensive to use technology and avoiding to utilising it. Despite the widespread use described here, there are still challenges. In order for a full integrate technology, teachers should be provided with an ongoing in-school training, support, and appropriate digital technological tools. However even though technology is required in the curriculum, studies indicates that teachers should be fully equipped and prepared to use technology it in their daily practice.

2.12 Theoretical perspective: Sociocultural Theory

Vygotsky (1978) sociocultural theory of learning and development was applied to understanding learning environments during remote learning and the impacts on learning. Thus, Vygotsky (1978) as cited in Jaramillo (1996) believed that learning occurs in social situations and emphasized the significance of interactions and culture. In addition, he claimed that learning is the result of individuals' sociocultural contacts and their involvement in community knowledge practices, which are supported by others in the community who are more informed than them. Interactions with peers, professors, and other specialists help learning in social environments. furthermore, when learners interact and work with more knowledgeable persons, such as professors or peers, they learn (Vygotsky, 1978). Teachers facilitate learning by establishing an interactive learning environment that allows collaboration (Jaramillo, 1996).

Through discussions, collaborations, and feedback, the learning environment enhances the learner's ability to interact with other learners (Neff and Rucynski, 2021). Learner motivation is influenced by interactions among students, instructors, and the contextual aspects of classrooms through activities. Classroom activities refer to what lecturers and students, as well as students and students, say and do to one another (Lewis *et al*., 2006).

Due to the implementation of remote learning, certain face-to-face learner interactions in the selected HEIs were disturbed. While it was possible to continue interactions through online platforms, factors such as a lack of compatible devices, an inconsistent supply of electricity, an unstable internet network, a high cost of data, and an unconducive home environment have a negative impact on the quality and extent of interactions. The established experiences are explored considering online student interactions, which Vygotsky (1978) considers to be crucial for effective learning.

2.13 Technological Pedagogical Content Knowledge Model (TPACK)

Finally, the far-discussed technical Pedagogical and Content Knowledge Model (TPACK) will be discussed in this literature review. Without considering the TPACK model, particularly Mishra and Koehler (2006), contribution on the expected role of the teacher, this literature evaluation wi be incomplete. Some key elements of the TPACK model will be evident in how the teacher integrate ICT in the classroom. According to Mishra and Koehler (2006), teachers need knowledge of the following:

- The interplay between technology and content and what meaning that a teacher is aware of the use of content and appropriate technology to be used in the classroom.
- The interplay between technology and pedagogy knowledge and what comprises the teacher's ability to teach technology skills to learners and expose them to technology in the classroom.
- The intersection of technological content knowledge, technological pedagogical knowledge and pedagogical content knowledge contribute to the establishment of TPACK.
- The seven TPACK bodies of knowledge are described below:
    - Pedagogical knowledge—knowledge of teaching methods and how to use them.
    - Content knowledge— the ability to know the subject matter.
    - Technology knowledge—knowledge about standard technologies and how they work.
    - Technological content knowledge-knowledge of technological subject matter.
    - Technological pedagogical knowledge—knowledge of standard technologies and how to implement/use it in different teaching and learning settings.
    - Pedagogical content knowledge—knowledge of teaching methods for the various subject matter.
    - Technological pedagogical content knowledge—knowledge of using technology to implement various teaching methods for various types of subject matter content.
- The intra-relationship between the TPACK bodies of knowledge which indicates a teacher's ability to plan lessons and select appropriate technological resources and pedagogical strategies with technology to teach learners relevant content. When TPACK is demonstrated, the technology used in the lesson complements and enhances the learners' understanding of the content.

The implication of the TPACK framework foresees properly prepared teachers taking advantage of the exclusive features of the technology to teach content in a way that promotes a quality learning experience for students (Garofalo, Harper, So, Schirack, & Stohl, 2001, in Apeanti, 2016). In addition, TPACK provides knowledge to solve difficult concepts and makes them easy to learn as well as helping to address some of the problems students may face. The TPACK framework explains how knowledge of technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones (Koehler & Mishra, 2006, 2009). Figure 3 and Table 2 depict the connections between and among content, pedagogy, and technology to provide interactions, affordances, and constraints. According to Mishra and Koehler (2006, p. 2025), knowledge about content, pedagogy, and technology is central to developing a good teacher.

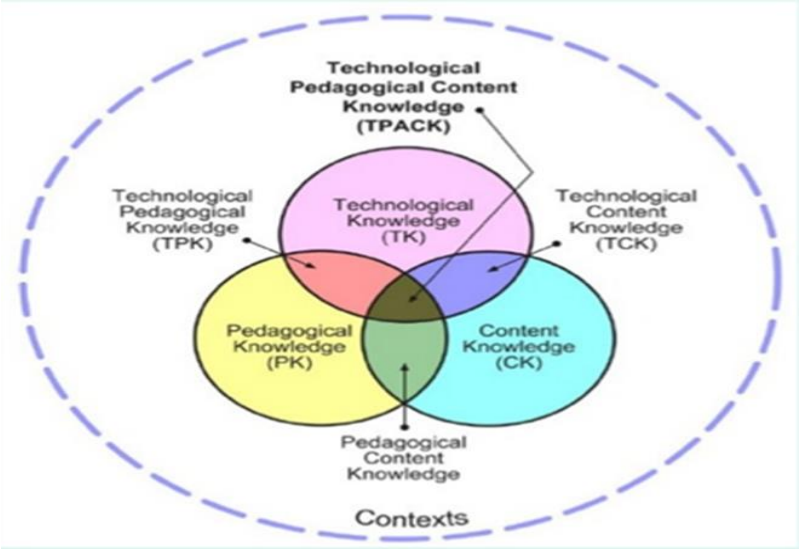

Figure 3:TPACK model: Adapted from Mishra and Koehler (2006)

Table 2 summarises the breakdown of TPACK model as per Mishra and Koehler (2006)

Table 2: Provide meaning to TPACK bodies of knowledge

Body of Knowledge	**Meaning**
Pedagogy	Application of learning theory in a classroom; differentiating technique; grading practices
Content	The ability to know the subject matter
Technology	Knowledge about standard technologies and how they work and used in the classroom teaching
Pedagogical Content Knowledge	Knowledge of teaching methods for various subject matter
Technological Pedagogical Knowledge	knowledge of standard technologies and how to implement/use it in different teaching and learning settings
Technological Content Knowledge	Knowledge of teaching methods for various subject matter
Technological Pedagogical Content Knowledge (TPACK)	knowledge of using technology to implement various teaching methods for various types of subject matter content

The TPACK model was criticised heavily by Angeli and Valanides (2009) who began to question its applicability in teacher education. They viewed TPACK as a transformative model. They argued that two component knowledge areas once blended to create an interpretational knowledge domain cannot

be unwoven afterward. Colvin and Tomayko (2015) were of the opinion that there is “no consensus found in the literature about which approach to the interrelational knowledge areas of the TPACK framework has more validity” (p. 32). Thus, there is a lack of clarity on how TPACK can be used in the classroom scenario. They acknowledge the importance of TPACK to teachers; however, the model is not clear on how to integrate technology.

Conclusion

In conclusion, this chapter reviewed literature and studied the abrupt transition to ERT and teachers' preparedness and perceived effectiveness, satisfaction, attitudes, and anxiety. ERT theoretical framework was adapted, however TPACK was included to highlight the knowledge teachers need to have when teaching using ICT. The results demonstrate teachers that were willing to switch to ERT due to their high perceived effectiveness and satisfaction the teaching method provides. However, this could be ascribed to long-term plan due to the lack of infrastructure and teacher training investments prior to the implementation of ERT. The increased anxiety on both teachers and learners, could be attributable to a combination of factors relating to readiness to employ ERT and the COVID-19 outbreak which caught most people not prepared. (Alqabbani *et al*., 2021).

CHAPTER 3: RESEARCH METHODOLGY

3.1 Introduction

This chapter gives an outline and justification of research methods that were followed in this study in the process of collecting data. It provides information on the participants selected and criteria for sampling. The researcher describes the research design that was selected for the purpose of the study, in addition the researcher described the suitable instruments used for data collection and the methods used to analyse data, furthermore the ethical issues that were followed in the process are discussed.

3.2 Research Methodology

It is crucial to understand that a wide range of techniques can be used to conduct systematic observation and testing. Many researchers only associate scientific research with laboratory experimentation. However, it is neither feasible nor desirable to research every relevant phenomenon in a lab setting. Any study's design starts with choosing a topic and a method of inquiry. These early choices are based on presumptions about the social environment, how science ought to be done, and what genuine issues, answers, and "proof" standards are. Different research methodologies include both theory and procedure. There are two generally accepted methods: quantitative research and qualitative research (Cohen *et al*., 2017).

Creswell (2003) defines quantitative research as a means *"for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures*". Quantitative research is a study into a known issue that is built around a hypothesis that is quantified with data, and statistically assessed. Quantitative approaches attempt to determine the validity of a hypothesis's prediction generalizations (Creswell J. W., 2012). In contrast, a research based on a qualitative method of inquiry aims to comprehend a social or human issue from numerous perspectives. A sophisticated and comprehensive image of the phenomenon of interest is developed through the process of qualitative research, which is carried out in a natural setting.

Since reality is objective and independent of the researcher, it may be analysed objectively using quantitative approaches. Additionally, the researcher should maintain their objectivity and independence from the subject under investigation. The research is free from interference when the researcher's beliefs are not incorporated into it or interfere with its completion. The statistical model employs deductive forms of logic and theories and hypotheses that are investigated in a cause-and-effect order. The aim is to produce generalizations that advance theory and help the researcher

predict, interpret, and explain a phenomenon. The basic presumptions of qualitative approaches are that there are numerous realities present in any given setting when the researcher conducts research on the subjects under study. The researcher engages with the subjects of his research and makes an effort to keep as little distance as possible between himself and them. Creswell (2003) defines qualitative research as a *"means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures. Data is typically collected in the participant's setting. Data analysis is inductively built from particulars to general themes, and the researcher makes interpretations of the meaning of the data"* (p. 4).

Qualitative research is an in-depth study of social and cultural issues that focuses on text, whereas quantitative research explores general trends throughout the population and focuses on numbers methodology that promotes the systematic integration, or mixing, of both quantitative and qualitative data within a single study. Furthermore, while reviewing the literature to support your research problem is important, it does not help in answering the research. According to Myers (2009) Qualitative research has the traits of being context-bound and having the researcher expressly acknowledge the value-laden nature of the research (p. 8). Unlike quantitative methods, inductive types of reasoning are the foundation of qualitative research. Instead of being predetermined by the researcher, categories of interest arise from informants (subjects) during data processing. The objective is to identify patterns or hypotheses that assist in explaining an interest phenomenon (Kothari, 2004).

This study adopted a qualitative research approach to learn more about teacher experiences with ERT, the reason for adopting qualitative research approach, according to Mc Millan and Schumer (2010), qualitative approach allows in-depth understanding of social and culture phenomena. In addition, Bell (2005) states that the purpose of qualitative approach is for the researcher to gain insight into participant's perspectives and experiences. Therefore, qualitative research method assisted the study in getting in-depth understanding of teacher's encounters when they were forced to switched to ERT unprepared. The information that was collected during the study, was to understand teachers' challenges using ERT and recognise that ones that they can conquer. This study depended on teachers sharing their challenges and how they can overcome.

3.3 Research Paradigm

The research paradigm makes a significant contribution to the definition of scientific research philosophy, according to literature on the subject. According to this literature, a researcher must have a distinct paradigm or viewpoint that informs their philosophical, theoretical, instrumental, and methodological foundations. In addition, Cohen *et al*. (2017) state that the research paradigm is a broad structure that encompasses perceptions, beliefs, and awareness of various theories and practices used in conducting scientific research. The scientific research paradigm is also distinguished by a precise procedure that is divided into several stages. By completing the steps, the researcher establishes a connection between the study questions and goals. Furthermore, Gliner and Morgan describe a scientific research paradigm as the approach or thinking about the research, the accomplishing process, and the method of implementation it is not a methodology, but rather a philosophy which provides the process of carrying out research in a particular direction. Ontology, epistemology, methodology and methods describes all research paradigms (Creswell J. W., 2012).

3.3.1 The Ontological Assumptions

It is crucial to define ontology before describing the specific kind of ontology employed in these investigations. Ontology is defined by Crotty (2003), as “the study of being”. It is concerned with “what kind of world we are investigating, with the nature of existence, with the structure of reality as such”. Guba and Lincolin (1989) view ontological assumptions as those that address the queries "what is there that can be known?" or "what is the nature of reality?" The first investigation employs an ontology, which is fundamentally a social universe of meanings. In this environment, researchers must believe that the universe they are investigating is populated by humans, each with their own set of thoughts, interpretations, and meanings. The researchers' investigation of this world is clearly manifested in their use of different interpretive design research methods and techniques such as interviews and reaction papers written in a pronunciation course in response to challenging readings in order to interpret the teachers’ feelings and inner thoughts about use of digital technology.

3.3.2 The Epistemological Assumptions

Epistemology is ‘a technique of understanding and explaining how we know what we know’. Crotty (2003) states that epistemology is also ‘concerned with establishing a philosophical framework for choosing what forms of knowledge are conceivable and how we may assure that they are both sufficient and legitimate (p. 3). The first study's epistemological viewpoint is constructionism because it is a learner-centered approach, and create a meaningful environment that includes

communication and collaboration. Crotty (2003), defines constructionism as "the belief that all knowledge and hence all meaningful reality as such is contingent on human activities, being produced in and out of interaction between human beings and their world and developed and transmitted within a basically social framework (p. 42)." As a result, when learners used the digital tools, they create meaning rather than discovering something new (Maynard, 1994, p. 10).

3.3.3 The Methodological Assumptions

Methodology is defined as "the strategy, plan of action, process, or design underlying the selection and use of specific procedures and relating the selection and application of the methods to the desired outcomes." (Crotty, 2003, p. 3). Its goal is to describe, assess, and justify the usage of certain approaches. The approach employed in the study is qualitative research methodology. The research investigated teachers' experiences with digital tools in teaching and learning using ERT. It also considered how to promote ERT as another digital learning instrument in the future. The data was thematically analysed, and the interview responses were transcribed and analysed.

3.4 Research Design

De Vos *et al*. (2012), define the research design as a procedure in which the researcher concentrates on research paradigm and methodology to make decisions about what strategy or strategies are best to be used to meet the research goal. Similarly, Scott and Morrison (2007) who defines a research design as the plan that represents a complete research study, this includes an overview of the planned research topic.

Research design refers to the advance planning of the methods to be used for collecting relevant data and the techniques to be used in their analysis. Research design is required since it helps the various research operations run efficiently. In fact, research design has a significant impact on the reliability of the results obtained and, as such, serves as the firm foundation of the entire structure of the research work, additionally, the design assists the researcher in organizing his ideas in a manner that allows one a to search for deficiencies and inadequacies. Such a design can even be given to others for feedback and criticism. It will be ineffective in the absence of such a course of action.

3.5 Case Study

In a case study, the researcher investigates a single entity or phenomenon ('the case') constrained by time and activity for an example program, event, institution, or social group and collects detailed information over a long period of time using a variety of data collection procedures. A case study is a descriptive record kept by an outside observer of an individual's experiences and/or behaviours.

This study was conducted using a case study because it was conducted in three different townships secondary schools. The study sought to investigate what challenges can be overcome if teachers are to effectively adopt remote teaching as an alternative teaching method. The researcher was able to gain in-depth understanding from participants on Remote Learning and its affordances in township secondary schools. McMillan and Schumacher (2010) define a case study as a single entity that is deeply analysed, in addition, Scott and Morrison (2007) pose that a case study is research where one or few cases are studied, and the focus is on collection of large amounts of data and studying it in detail. Stakes (1995), (cited in Creswell, 2003, p. 15) states that case studies is in which the researcher explores in depth a program, an event, an activity, a process or one or more individuals.

The cases were bounded by time and activity, and researchers collected detailed information using a variety of data collection procedures over a sustained period of time. In the same way this study used collective case study because it was conducted in different townships secondary schools. Each case was handled as an individual, and the conclusion was used as data to support the entire study. The conclusions of this study are not intended to be generalized. However, the study's findings contributed to the body of knowledge.

3.6 Sampling Method

To discover challenges that hinder effective reconceptualization of remote teaching and to identify challenges that can be overcome by teachers, data was collected from three schools in one of the Gauteng province districts. These are some of the few schools where there are functioning computer labs and there are Computer subjects of CAT and IT. To select these schools the researcher used a list of top 10 school in 2021 for grade 12 results.

The researcher used a purposive sampling method, it is used to more accurately align the sample to the research's goals and objectives, strengthening the study's rigorousness and the reliability of the data and the results. Purposive sampling allowed the researcher to gather data through interviews, which provided better insights and more precise research information. McMillan and Schumacher (2006) states that purposive sampling maintain that purposive sampling data is selected based on the knowledge of the population and the purpose of the study. Creswell (2012), describes that qualitative approach objectives, is to collect an in-depth exploration of a research area, therefore the researcher purposefully selected individuals and these individuals were used to give information which can be generalised into research. With purposeful sampling, researcher collected information from the best suitable participants. The results were relevant to the research context. The purpose of choosing this area, was that the researcher is located in this area.

3.7 Research instruments

Data generation methods are the specific tools or instruments that are used in order to illicit information (data) from research participants (Cohen *et al*., 2011). In addition, Creswell (2002), describes qualitative research methods as emerging method to open ended questions interview data, observation data, document data and audio-visual data, text, and image analysis (p. 17). This study adopted qualitative methodology and a semi-structured interview was used as methods of data collection. Furthermore, De Vos *et al*. (2012), states data collection instruments in quantitative study require the researcher to frequently contact the participants (Cresswell, 2014), which is in contrast with qualitative research method.

McMillan and Schumacher (2010, p. 343), further outline numerous data collection methods that are used in qualitative study which are observation, interviews, questionnaires, document review and the use of audio-visual materials. This research study adopted semi-structure interviews not only focusing on the individual participants, since it is a qualitative study the researcher recorded whiles interviewed the respondents after transcribed the recorded information. How ever Since there are COVID-19 restrictions to observe the protocols, the data was collected from different online platforms, such as ZOOM or Teams and WhatsApp video call.

3.7.1 Interviews

All most all of the information was gathered through semi-structured interview questions. According to McMillan and Schumacher (2006), this is a certain, sort of, in-depth interview designed to study the meanings or content of personal experiences among the selected participants. Qualitative research uses interactive and humanistic data collection method that involves active participants, Interviews In qualitative research have both advantages and disadvantages. Some of the advantages is that they provide useful information when you cannot directly observe the participant. They permit the participant to describe in detailed personal information as compared to other data collection method (Creswell, 2003, p. 218).

In the interviews process, respondent is verbally questioned in order to gather the data needed for the research. The interviews were conducted on one-on-one basis In order to have a thorough understanding of the teachers' opinions and understanding of adoption of Remote teaching as one of the official teaching methods. interviews have been used in the study to stimulate open discussion among respondents and to ensure a thorough comprehension of the reconceptualization of remote teaching, both closed-ended and open-ended questions were used in the study. Additionally,

interviews make it easy to allow changes when challenges that are not prepared for comes. hence the study used one-on-one interviews to allow participants to speak and express themselves freely to get a deeper understanding in their challenges and also give suggestions and solutions on how they could be conquered. The interviews were conducted on online platforms due to COVID-19 protocol. Copies of interview questions and were sent to teachers beforehand so that teachers could prepare themselves before the interviews.

3.8 Data Analysis

De Vos *et al*. (2012) cites Patton (2002) who describes data analysis as the process of transforming data into findings. Qualitative data analysis is carried out using different techniques which are most suitable to the kind of data that has been generated. Due to this, the interview data was content analysed (Cohen *et al*., 2011). Qualitative data, includes the three steps of analysis are data organization, data summarization, and data interpretation. The study's data analysis was done using Figure 4 below.

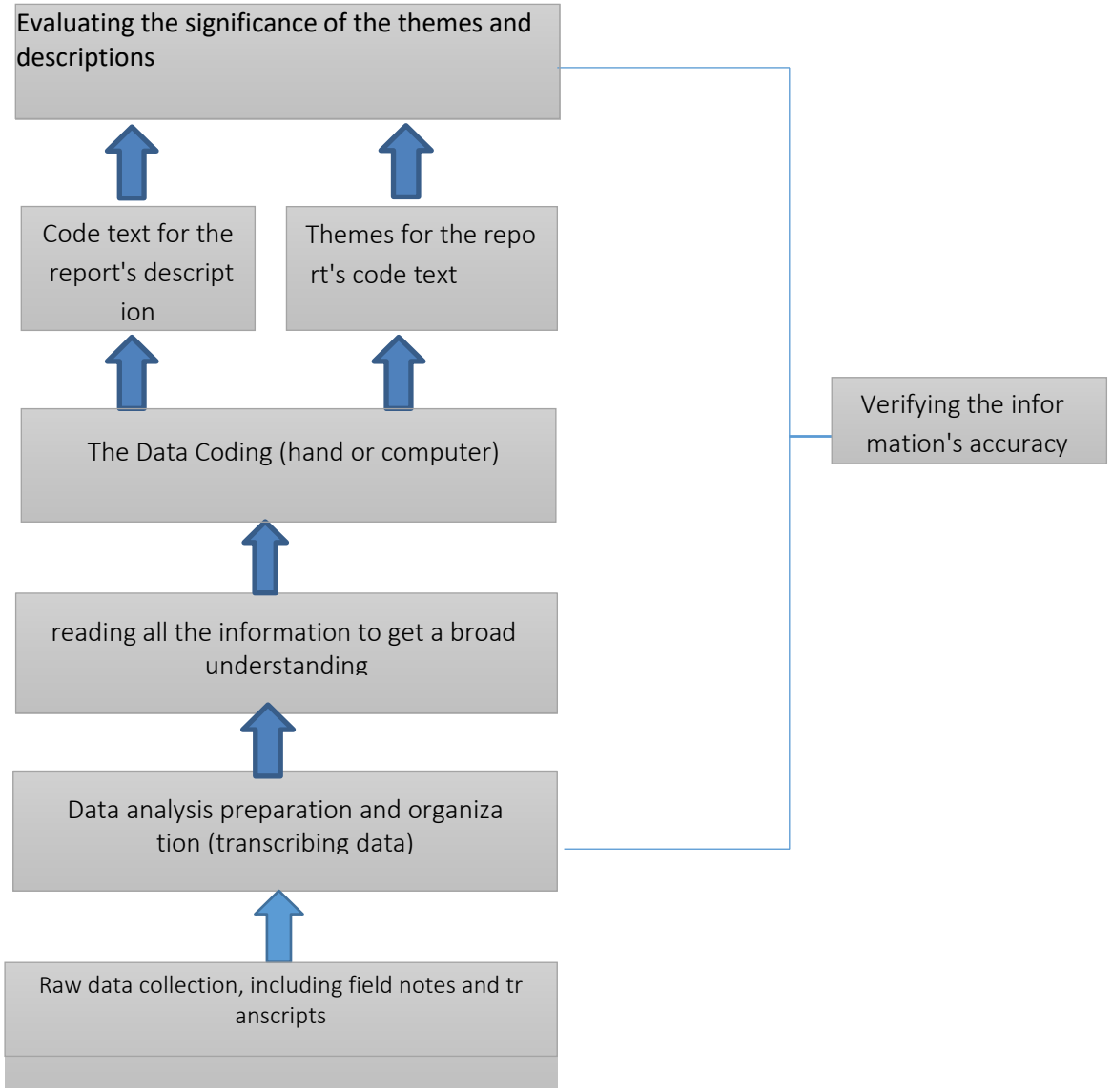

Figure 4 Data analysis in Qualitative Research (Creswell (2012), p. 237).

The content analysis approach used in the study. It assisted to analyse all the data that was collected through interviews, themes and codes that are allocated to it. The data was transcribed from audio recordings to texts in English language because the study will be written in English language, the transcription was done using Microsoft Word. Following transcription, themes and categories were identified and coded. Themes were then analysed for their meaning in the current study, making it easier to answer the research questions such as "How should teachers regard ERT as a potential future instructional mode that can generate high-quality instruction and desired educational outcomes?".

3.9 Ethical Issues of the Study

Ethical issues refer to behaviour where a researcher considers the effects of the research on the participants and act in such a way as to preserve their dignity as human beings (Cohen *et al*., 2007). Ethics are necessary so that participants will feel respected, appreciated and recognised as respectable human beings. Cresswell (2002) defines ethics as morals and values that serve as a guideline towards individual's behaviour. In the same vein, De Vos *et al*. (2012) posit that researchers have an ethical responsibility to the discipline of scientific research and to the research participants of being transparent and accurate in the reporting the research procedure and findings. McMillan and Schumacher (2010) advise the researcher to meet the required ethical principles when educational research is being conducted to avoid ethical dilemmas.

Ethics was observed as an ethical letter clearance was obtained through the University' Human Research Ethics Committee (HREC) (See Appendix A). In addition, the Gauteng Department Education which granted permission to conduct research in its public schools was also obtained (See Appendix B). The permission letter to access the schools was sent to the school principals and the teachers after the permission to access the schools was granted by the ethics committee and the GDE. Consent letters were sent to research participants with detailed information about the purpose and goals of the study and what was expected of them.

Cohen *et al*. (2007) suggest that the principle of informed consent should be applied by researchers. research participants were informed that participation was voluntarily and can withdraw at any time should if they were no longer interested to take part in research. Participants were told that they can withdraw from the study at any stage of the study if they had wished to. Counsel was taken in addressing participants' privacy with sensitivity and their right to confidentiality and voluntary participation using informed consent and careful adherence to the research protocols.

3.9 Reliability and Validity

The University of the Witwatersrand's ethical code of conduct was followed while conducting the study. The participants were fully informed of the purpose of the study and how the collected data would be used. This was made possible through participation and consent forms that made clear the study's purpose. Anonymity was always maintained, and all information was private and confidential.

CHAPTER 4: DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

Data for the study was collected through interviews. This Chapter presents the data obtained from participants as well as analysis and discussion. The data gathered from the interviews were intended to get in-dept knowledge of teachers experience and challenges that can be overcome by teachers to adopt ERT equally known as online teaching in this research as one of the official teaching methods (Hodges *et al*., 2020). In addition, the chapter analysed data to identify themes to answer the research question, "How should teachers regard ERT as a potential future instructional mode that can generate high-quality instruction and desired educational outcomes?

4.2 Research participants

This study included three schools from the township. As the researcher is a secondary school teacher, these are all secondary schools. The reason for selecting secondary schools was to find out if teachers in these schools face the same challenges when using digital technology in their classrooms. GoL (donors) donated these secondary schools with 50 computers each, which are kept in a school laboratory, however, not all teachers and learners have access to these laboratories. Both grade 12 teachers and learners have access to the laboratories.

Table 3 below presents profiles of the participants in the three schools. The schools were code named A-C to hide their identities the participants were pseudo named AT1, AT2 (these participants are coming from the same school), BT3, BT4 (same school), CT5, CT6 (same school). In total there are six participants that participated in the study (four females and two males) and all teach different subjects.

Participants	Age and Gender	Experience	Subject(s)	Qualification
A AT1	31 Female	8	Accounting	Masters Degree
A T2	28 Female	4	English	Honours Degree
B T3	29 Male	6	Mathematics	B Ed
B T4	25 Female	5	Economics	Honours Degree
C T5	49 Male	15	IT	ACE
C T6	32 Female	7	CAT	B Ed

Table 3 Teachers Profile

The data collected from the research study was presented regarding the following categories:

- Teachers understanding of ERT.
- Teachers experience in implementing ERT in their practice.
- Challenges implementing ERT after Lockdown.
- Professional development in ICT space.
- Teacher's perspectives of ERT.

4.3 Teachers understanding of Emergency Remote Teaching (ERT)

Most of the participants displayed limited knowledge about ERT. They seem to be not knowing the demarcation between the Online learning and ERT. In general, ERT is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances, teaching temporary moves from face-to-face to online learning (Hodges *et al*., 2020, p. 1). It entails using totally remote teaching solutions for instruction or education that would typically be offered in person through blended learning or as hybrid courses. That tends to switch back to normal once the crisis or emergency has passed. The participants displayed a heterogeneous view of their understanding of ERT. AT1 mentioned that ERT is about,

> *The primary components of this system of instruction, also known as distance learning and online learning, involve the physical separation of teachers and students during instruction, learners learn on their own at home.*

AT1 views ERT as a learning process conducted through distance mode, rather than having learners and teachers coming together face-to-face. Remote learning means that learners are separated from their teachers and do the learning on their own using available digital tools. ERT ensures that teaching and learning continues despite of any crisis that might disturb learning process. However, AT2 expressed mixed up knowledge about ERT. To her, ERT "*learners learn on their own without guidance or supervision from the teacher"*. It is evident that the participant has not fully understood the idea of what ERT entails. Her explanation perceives that learning is through distance education and there is no interaction between teachers and learners.

Participant CT6 is of the opinion that teaching and learning online should be of constructivist approach and be of full of activities. This is her remark:

ERT practitioners continue to apply constructivist learning theory significantly. According to this theory, learners encode and interpret information based on their individual perceptions and experiences. Constructivist learning environments enable learners to construct their own meaning and understanding from learning materials and situations. Constructivists also contend that learners develop up new knowledge on their own and use it to build upon prior knowledge and experiences.

In her attempt to describe what ERT is, she mentioned about constructivist theory, a concept that is not related to the ERT instructional modality. She did not show how this constructivist concepts are embedded in the ERT. Though the researcher was expecting her to talk about ERT as an instructional delivery to mediate crisis, she saw the concept of ERT as a learning paradigm.

As mentioned earlier, teachers were caught unaware on how to use this method in their teaching, particularly those in township. Teachers, and principals alike, were not brought to know this concept of teaching modality. BT4 mentioned that ERT is

…. a method teachers use that help learners to understand the concept being taught. You know sometimes learners cannot understand the concept using one method of teaching. So, you need to vary……

The participant indeed does not understand the concept despite that the ERT acronym was explained to her. She went far near the concept by seeing ERT as a method of teaching learner to reinforce understanding of the concept.

BT3 and CT5 demonstrated a partial understanding of ERT. Two participants mentioned that this learning occurs online under supervision of an instructor.

ERT is education that takes place over the Internet, also mention that it is also referred to as e- learning or distance learning in other terms [BT3].

Another sort of distance learning is remote learning, which is the general term for all online and non-traditional classroom learning [CT5].

The ERT, according to the two, is a form of distance learning. There does not appear to be a distinction between distance learning and online learning. Even though they are grouped together, there is a distinction between online learning and distance learning. When conducted through virtual platforms such as MS Teams, Zoom, Google Meet, and others, online interactions between a teacher and a learner occur on a regular basis. It supports both synchronous and asynchronous communication. This is due to the fact that online learning is used as part of a blended learning strategy alongside other teaching strategies. Distance learning, on the other hand, does not involve any in-person interaction between teachers and learners. Different types of interactions between teachers and learners are included in distance learning and online learning, such as recording lessons and sending assignments.

4.4 Teachers experience practicing Emergency Remote Teaching

Academic institutions were compelled to suspend face-to-face instruction and other learning opportunities as a precaution against the COVID-19 risk. As a result, schools in South Africa, both primary and secondary, began to take several steps to implement social isolation methods. Using the concept known as ERT, online learning was seen as an instant alternative to continuing with learning. It was deemed useful because it can provide an engaging and dynamic learning environment. However, due to time constraints, it was anticipated that the learning process would continue in the equal manner as in-person. It was just dictated to teachers to adopt it without understating it and without skill to implement it. BT4, asked:

> *How can I teach remotely when I don't have a basic laptop from GDE, I'm even in ICT committee but I was not given a laptop. It was impractical to teach remotely without the necessary devices*

Resources remains one of the top challenges for educators to implement the online teaching especially in the township areas. To make it worse, BT4 is in the school ICT committee, however she was not given any laptop. It makes one wonder what work she does in the committee when she has no device to use. This scarcity of resources was echoed by CT6, who mentioned that many computers in the lab are not working. She exclaimed:

> *The lab has about 30 computers, but only 10 are working. Once they malfunction, the department does not send the technician to repair. Thus, it is also a challenge to reach all learners using the resources in the lab.*

It is clear that the schools are not receiving the adequate support from the department. Generally, if computers are down or malfunctions, they are reported to the Department of Education technician who takes the responsibility of maintaining them. The comment from CT6 indicates low support offered by the department. Even though the computers malfunction frequently, learners are also poorly resourced with digital infrastructures because of their socio-cultural background. AT2 is concerned about the economic heterogenous of their learners. Some have recently released digital gadgets, some have old incompatible digital gadgets, and some have nothing. It is difficult to use a single teaching method in that situation. This is what she said:

> *Not all learners have digital gadget such as Tablet and iPad or even smartphone. Very few can have such gadget, but the majority do not have at all due to their socio-cultural background.*

It is difficult to teach using technology when students do not have access to such platforms. Digital instructional design necessitates that learners have access to digital tools in some form or another. The information could come from the teacher, peers, or a non-human machine, that is, searching information from the internet.

BT4 added a similar sentiment concerning the social backgrounds of learners. She mentioned:

> *The problems we experienced is that not all learners have these educational digital tools, at the same time the school is under resourced. For instance, not all classrooms have functional smartboards, they are found in grade 12 classes, and some have technical glitches and no longer usable. It is because our school is not a fee paying, hence there is no money to cater for the maintenance of such infrastructure. Fee paying schools do not experience our problem…*

It is important to keep in mind that, in general, teaching with digital infrastructure is difficult in township schools due to unequal socioeconomic terrain. The school lacks adequate infrastructure, and the existing infrastructure is not properly maintained to provide the services intended.

BT3 echoed a similar view but focusing on the issues of network connectivity. He commented:

> *Unfortunately, in a society where everything is done online, technical problems will eventually occur. Although it may seem obvious, internet connectivity problems and technical difficulties only serve to frustrate online users and disrupt new users of online learning sessions. When your computer crashes, your Wi-Fi is inconsistent, it can be difficult to keep up with your online classmates and the learning environment.*

Teaching using online driven by the availability of network connectivity. In the absence or intermittent network connectivity frustrate good use of instruction that is online based. BT3 mentioned that inconsistent WIFI connectivity make it difficult to teach using online. To upload materials on the learning management system requires the availability of network and so is the communication with learners.

The participant highlighted the challenge of infrastructure and the gap between township schools and model C. Participants displayed limited use of remote teaching during lockdown, CT5 rudimentarily used remote teaching for few weeks, as compared to other participants from former model C schools who are at a certain extent who were exposed on how to use digital infrastructures for teaching and learning. Township school teachers experienced some challenges such as lack of knowledge and skill towards digital tools in the classroom practice. CT5 commented:

> *It was impractical to teach online. Half of the learners here at my school do not even own a mere smartphone, there might be even at their home their parents don't have access to a smartphone. In addition, as teachers we do not have proper experience teaching using digital tools unlike teachers from former model c schools who are exposed in using such tools.*

In summary, teachers who attempted to use ERT mode of instruction reported poor learner attendance due to factors such as some learners being in their hometowns where connectivity problems exist, as well as a lack of enthusiasm on the part of the learners to attend classes due to a lack of digital tools with which they would learn. On the teacher side, there was a requirement to create online content and distribute materials to students via various digital technology enablers such as emails, WhatsApp platforms, and uploading to learning management systems. Despite technological disadvantages, some teachers found online teaching to be more time-consuming due to more preparation.

4.5 Teachers Challenges implementing ERT after lockdown.

While ERT continues to provide numerous pedagogical benefits, it is impossible to overlook some of its drawbacks and the associated difficulties in online learning that resulted from lockdown and its aftermath for teachers. Among the issues are a lack of digital tools, insufficient teacher training, and procrastination due to a lack of motivation. One of the most common habits that undermines instructional efficiency, particularly in distance learning, is a lack of digital tools. Furthermore, internet connectivity is a challenge in and of itself, among other issues, physical and psychological isolation of distance learning participants is a significant issue, and additional learners require training to use online learning platforms.

> *The sudden transition to ERT tried to close the learning gab that was created by lockdown, which may have a significant long-term repercussion on learners. The disruption to education brought on by the COVID-19 pandemic may have long-term impacts on cognitive development and life chances for our learners in the township school, who have been the most impacted, learners at my school they stayed almost three months without being taught, due to the reason that, I was not able to teach remotely because of the lack of learner's technological digital tools [BT3]*

Participants were concerned with learner's different background that it does not allow learners to learn online. CT6 explains the impact of learner's home environments in ERT:

> *The negative impacts of switching to remote learning is significantly influenced by a student's home environment as well. The financial standing of the family and the presence of supporting encouraging adults, these are two factors that have a significant impact on the educational outcomes for learners from township while participating in remote learning. Learners from households with higher incomes frequently have greater access to resources like technology and the internet as compared to learners from township.*

Learners who have supportive family members typically perform better in online learning environments, especially when the supportive adults are parents with a college education or who play an active role in their children's education. The accessibility with which teachers and other school personnel could be contacted influenced the quality of remote learning. Parent involvement and support increased significantly when teachers and other school personnel were available for tutoring or held extended virtual office hours. Teachers agree with the statement, however, when township

teachers attempted to continue with remote teaching after lockdown restrictions were eased, they encountered challenges. AT1 shared her concern with the support of digital tool maintained.

> *How am I expected to continue to teach online whiles my laptop that was provided by the Department of Education crushed months ago till to date it has not been fixed. I have requested a technician to come at my school and fix the laptop, unfortunately I have not received any assistance. What more about the learners who most of them are not in position of any digital tool to use for online learning.*

AT2 was concerned about most of learners who don't even school afford meals, how much more of digital tools. She explained:

> *Most of our learners depend on the feeding scheme for breakfast and lunch. In that sense, how are they expected to have digital tools that support remote learning. The fact that they solely depend on the school feeding scheme, that means their home backgrounds does not support Online learning. A practical example, if it happened that the school comes out before lunch, learners in my school will have to wait for school feeding scheme food to be ready and eat before they go home.*

CT5 shared the same sentiment about parental support an parents not being able to afford digital tools when learners are learning remotely. His remark was that parental support is close to no existence.

> *Parents shared they frustrations when their children learn remotely. They said "even if we want to assist but we don't have adequate knowledge to assist our children". Some learners live with their grandparents and other learners live in a child headed homes. This is a clear indication that not only township educators are inconvenienced by the remote teaching.*

AT1 added:

> *Learners who have supporting family members typically attend their classes better in online learning environments when there is a supportive adult. The quality of online learning is also impacted by how easily teachers and other school staff could be reached, and they are available at most times. When teachers and other school staff are available for teaching remotely, parent involvement has a great impact and makes the process effective.*

Learner attendance is also a challenge. Teachers complained about parent resistance to assist with monitoring their children attendance. BT4 added the same sentiment:

Most of the learner's parents are working during the day. On the other hand, in our school parental support is minimal. We are having a challenge even when parents are called for a meeting 10% will attend. I believe that assistance and support from parents to monitor learners' attendance can make the remote learning effective.

4.5.1 Internet connection

Remote learning suffers from poor or non-existent connectivity. There is currently insufficient data connectivity to determine the impact of remote learning after some schools have resorted to or considered transitioning to online education.

BT4 elaborated:

In a remote learning environment, a learner's capacity to achieve academically is significantly impacted by slow or patchy internet connectivity. Given the South African version of the global digital divide, it is obvious that some homes have better access to high-speed internet than others.

Connectivity is not the only issue. AT1 added:

Affordability is an issue, some of the parents do not even afford a mere entry level smart phone, that is something that is far from them.

Teachers are concerned with slow connectivity even at schools.

In my school there is WIFI is available from the DBE. Once learners start to connect, the connectivity drops and it will not connect. The live broadcasted lessons will not be able to stream [CT6].

In my school there is a high roll of learners. Others start to connect to the internet when they enter the school gate, or those who stay near the government infrastructures like library or other schools they hotspot from there. You will find both adults and children standing to connect [AT2].

Dropping internet connection during the lesson, most teachers complained about challenge.

When I attempted to teach online during class, learners' internet connection can completely disconnect, causing them to lose crucial class time and missing significant information and learning material, or fall behind [CT5].

Other areas in the township there is low internet coverage BT3 explains:

There are learners who stays in an informal settlement alongside N3. There is low internet coverage in that area. To teach online, having those learners, is unfair to them since they miss out on some of the information.

Remote learning and teaching in township schools is complicated and affects both the teacher and the learners. It can be difficult and very different from traditional classroom settings. While teaching is undoubtedly difficult, the effectiveness of ERT is dependent on the availability of digital tools. Due to limited resources and a lack of training, it is currently impossible to implement online learning in the township school system.

4.5.2 Theft in the area

Several schools have reported computer loss since computers and tablets were first introduced in classrooms. These challenges have also impacted schools in townships. According to participants, the majority of the community's population is unemployed, resulting in a high crime rate. As a result, computers and other educational resources such as tablets and smartboards are frequently stolen. CT5 commented:

Schools are victims of crimes in the area. This school gets burglars frequently and take school property. This happens almost three times a year.

AT1 echoed similar sentiment about the crime situation in and around her school. The government has given learners tablets and installed smartboard boards in grade 10, 11, and 12 classrooms. Members of the community have broken in and stolen such infrastructure that is meant to educate their children. She commented:

Grade 12 learners are given tablets, however the unemployed youth in the community forcefully take them away from learners as they come from school or on their way to school. They also steal digital infrastructure set up in grade 10, 11 and 12 classrooms.

Teachers complained about the community support including parental support. BT3 elaborated:

Learner were victims of crimes, some learners even experienced crimes from their own respective homes. One learner came to school to report that her uncle stole her tablet that was in the charger. The school had to open a crime case against the alleged uncle.

CT6 added:

> *There is even a learner-to-learner crime. The other learners in school were crying foul due to their tablets being stolen during school hours. The unfortunate part they would not be able to be traced.*

4.5.3 Use of social media

While DBE is attempting to implement ICT in schools, there are numerous contextual factors that are impeding progress. This demonstrates the department of education's attempt to provide digital tools, despite the fact that they were insufficient for all learners in schools. CT5 is using WhatsApp to teach remotely regardless of the limited resources.

> *I try to use WhatsApp with my learners despite limited resources such as intermittent network connectivity. Money to buy data and absence of other digital tool that can be used for learning purpose.*

AT1 mentioned that she uses WhatsApp, Facebook, and YouTube videos to continue reaching her learners. However, this created inequality in the accessing teaching materials as not all learners have digital gadget to access what was taught. She stated that:

> *In my school I try teaching using WhatsApp, Facebook or YouTube videos. This has, however, created a problem as not all learners will be accessing the concept taught. It is only those learners whose parents afford to buy such devices that access the information taught leaving out learners who could not afford. Generally, this creates inequalities to equally access education.*

In this modern teaching and learning era, where learners and teachers can meet virtually to conduct lessons outside of the physical classroom, social media plays an important role. However, these social media platforms come at a cost. Those who can afford to buy digital devices and data would be at an advantage, while those who are less fortunate would be at a disadvantage because they lack resources that would allow them to continuously access their education.

4.5.4 Learning Management System (LMS)

The participants were asked if their schools has a learning management system (LMS) where teachers and learners can upload and access learning materials. Two schools have learning management systems, one of which is Moodle and the other is D6. According to the findings of the study, not all teachers are familiar with these systems. One of the most effective technologies for facilitating remote learning is a learning management system. However, careful planning is required.

While remote learning classes provide learners with greater flexibility and innovative ways to collaborate, success in the virtual classroom is heavily dependent on how the lesson is presented and how engaged both teachers and learners are. Learners learn more effectively when the lesson is engaging, they process the content more deeply as a result. A teacher's presence in an online class does more than just encourage students' learning and engagement. The presence and conversation of the teacher, as well as carefully selected inclusive learning activities, make the difference. AT1 shared her experience when teaching using LMS:

> *Even though LMS was designed to make teaching and learning simpler, it seems to be a nightmare for us who have not been trained to use it. The system seems to be ideal and effective for teaching and learning, however the lack of training on how to use is letting us down. Thus, I continue using traditional method of teaching where learners feel my presence and my engagement.*

Teachers should have access to a platform that helps them overcome the challenges that come with using a learning management system. When a school implements an LMS, it should ensure that teachers are trained on how to use it otherwise the system will be a white elephant. As a result, teachers reject the system and continue to teach in the traditional manner, engaging learners face to face. CT6 explained her frustration about D6 learning management system,

> *The school has D6 LMS that was set up just two years ago. Almost no one knows how to use the system. It appears it is only people in the school administration that knows how to use the system to communicate with parents and learners. If I try to get in the system, it requires me to provide login details which the school did not provide. At the same time the school encourage us to use the system for teaching and learning which we are not trained on how to use it. Otherwise, it is a good idea to use this portal, however we need training first.*

AT2 shared the similar sentiment about the lack of training. She remarked:

> *One of the challenges we are facing as teachers is lack of knowledge and skill in using LMS. For example, our school has Moodle learning management system which is ideal to upload learning materials and assessment for learners. However, we are not trained to use the system. It is only the administration people who knows how to use the system. Sometimes we go to them so that they can upload the teaching materials into the system but this a frustrating process, we need to do this on our own. For example, we need to upload pictures in the format JPEG, GIF, PNG, or WEBP and Videos in MP4, MOV,*

FLV, AVI, WMV format, these administrators face challenges when uploading such materials.

Managing and administering an educational establishment LMS requires a level of technological competence that most classroom teachers lack. As a result, individuals who make decisions about which technology to acquire and how to deploy it are frequently detached from the classroom and have only a limited understanding of the pedagogical implications of the final decisions on which activities to design. Despite the presence of LMS, teachers still do not know how to use this technology. They rely on the administration department for assistance, hence, causing teaching to disconnect. CT5 expressed his experiences:

I don't have knowledge in using Moodle LMS in my classroom. The school encourages us to use it but there is lack of technological support. In the meantime, it is only the administrators who know how to use it. I look forward to receiving training so that I can use the system on my own. Generally, this is a good idea of having this LMS in this era of technological advancement. Our learners need to know how to access their learning through it, as the world is on technological map.

It is undeniable that LMS plays an important role in this age of technological disruption. All participants acknowledge the advantages of LMS in teaching and learning. However, implementation is lacking. Systems are implemented without training the users, resulting in limited system use. Teachers become frustrated when administration takes too long to complete requested tasks. Delays the teaching and learning process in general.

4.5.5 Professional development in ICT space

The education department has taken significant policy and practice steps to ensure that everyone has access to education. The use of digital technology has gradually synchronized with the use of digital tools at all levels of the educational system. The use of technology has significantly increased the availability of information that enables ideologies and instructional strategies. Teachers are strongly encouraged to use and adopt information and communication technology to improve their teaching and learning practices. Managers, teachers, learners, and administrators are all included.

The COVID-19 pandemic and the subsequent lockdown in 2020 necessitated a rapid shift from contact teaching as by far the dominant mode of delivery in many townships school to ERT in online mode. This provisioning teaching mode was introduced as an entering solution to address the

academic needs of teaching staff and learners alike. This shift caught the teaching fraternity unaware and were required to implement the prescribed teaching mode. Many teachers' technological knowledge were exposed as majority had challenges in implementing the proposed method. The main reason is that teachers were not trained to use digital tools for pedagogical practices. Participants in this study confirmed not having received ICT training towards classroom use. The few that received training claim that it is not adequate for teaching practice. This is what AT2 and BT4 exclaimed respectively:

> *I've received training from first year of university, I believe that the educational course does not propel us enough to be able to use the digital tools in the classroom to enhance teaching and learning process.*

> *I did ICT in private college long time ago to be ICT literate. There has been a lot of changes in software for an example I used MS office 2000, today they talk of MS office 365 which I am not familiar with. Thus, I need some refresher courses to cope with.*

Both T2 and BT4 indicate that they are behind in terms of using ICT in teaching and learning. There were exposed Microsoft tools however it been long they since last using it. The two participants are of the opinion that the department of education should come with a program that can train them to use ICT tools for teaching and learning.

On the other hand, the senior teacher who trained more than 20 years ago stated that the Department of Education's ICT training is ill-timed. The course training duration is brief and rushed, with little emphasis on how ICT can be used in terms of teaching and learning. CT6 aggress confirms that Department of Education offers some ICT trainings but the training comes at odd times.

> *The ICT trainers comes during school hours and learners can't be left unattended for us to attend trainings. The time given for training is short and rushed.*

CT5 complained about the irrelevance of the training. Trainers focus on the use Microsoft suite package and do nothing in showing how to ICT for teaching and learning. This is his remark:

> *The training is rushed and is centred around Microsoft suite package.*
> *They spend most of their showing us how to use keyboard and format text. There is absolutely nothing that talks digital pedagogy in the classroom.*

It is clear that the participant is dissatisfied with the department's training, which is rushed and irrelevant to classroom practice. Instead, the training should concentrate on providing teachers with digital tool skills that can be applied to pedagogical instruction.

The ICT trainings are inadequate as training is done in a short space of time and is rushed. The training is not tailored to focus on a subject, but it is general making it difficult to be applied in the actual subject integration. This is what AT2, CT5, AT1 and BT3 mentioned respectively about the kind of training they are receiving:

> *In my school there are educators who are not familiar with ICT. They need different levels of trainings, some educators are familiar with ICT, then the older teachers display a need for more trainings [AT2].*

> *In our school most of us (teachers) we have not received enough training from the Department of Education. ICT trainers are not taking into cognisant of how we should teach using ICT to enhance learning. They should have knowledge of the subject not just general knowledge [CT5].*

> *My subject has very complicated topics, sometimes it's difficult to incorporate digital tools in a traditional classroom. Thus we need ICT training that is specific to the subject. This remote learning requires to expertise in teaching using digital tools in our own subjects [AT1].*

> *Training should not be generalised, it should be tailored to that subject hence the nature of the content is not the same. Educators should be trained more on Online assessments and interactive activities. The ICT coordinators require that some teachers that have gone this training to teach others. However, they are also clueless on how to integrate ICT to learning [BT3].*

Participants felt that they were only given basic training that was unrelated to classroom practice (incompatible with classroom practice). Because the trainers are not proficient in all subjects covered by the CAPS curriculum, it is difficult to tailor their training to specific subjects. Despite the department's efforts to train teachers in the use of ICT, the training takes place in a short period of time and is rushed, leaving many teachers with little understanding. Teachers complain that the

training is not well-organized and that the format is unsatisfactory. Following training, ICT coordinators work with the Department of Education to train other teachers in their schools. Surprisingly, the so-called trained teachers have no idea about integrating digital tools in classroom. It is unclear if the Department of Education does the follow-ups to determine whether coordinators are providing continuous teacher training and support or not.

4.5.6 Technical support

Teaching using digital tools requires a continuous support to deal with technical glitches. For instance, in banks and other commercial fraternity a technical team is always in place to deal with technical problem employees can face. Similarly in education such a team or people are needed to help teachers whenever they face a technical problems. The lack of support was noted by the participants AT2 and BT4 respectively:

> *In the school where I work, there is no technical support. If I have a problem with digital tools, I must bring in my own private technician or service provider. If one requires assistance from the Department of Education they will take forever to come, and teaching and learning would have been disturbed [AT2].*

> *Teaching using blended learning is a challenge for me. With my limited knowledge I encounter technical glitches which adequately affect my teaching. There is no one within the school that offers technical support. You have deal with that problem on your own [BT4].*

The participants are worried about a lack of support in their schools. Despite their efforts to teach using ICT, they run into some technical difficulties that disrupt the lesson flow. Despite the fact that they lack the necessary skills, they are expected to solve or repair problems on their own. As a result, they are requesting that the school or department provide technical support (technicians) to teachers if such technical issues arise.

4.6 Teacher's perception of ERT

Teachers perceived ERT as a short-term solution to the COVID-19 pandemic, which forced schools to shift from contact to virtual teaching. However, because they lacked the necessary knowledge and skills, many teachers were caught off guard when it came to teaching virtually. Many teachers discovered the hard way that relying solely on one method of instruction is ineffective. Most of them were used to traditional teaching methods and were forced to change them immediately, which was

difficult for many of them. Participants were polled to determine how to keep the ERT operational. Five out of six respondents expressed optimism about the future of such education.

> *The transition from traditional teaching to remote learning especially in township schools should not stop. We are in the world of digital technology; this should be a new way of teaching and learning. Instructions should be in line with the current technological advancement [BT4].*

> *This ERT should be maintained. The only that the department that the department need to do is to train on how to use this digital technology for pedagogical instruction. The world is changing and we cannot maintain one method of teaching [AT2].*

> *Personally, I am of the idea that this ERT should not be considered as an interim method of teaching. It should continue only the name can be change to online or something relevant. The government must make sure both teachers and learners have the resources that support teaching through ERT [CT6].*

> *I am not against teaching using ERT. The issue was the logistics and the implementation of the teaching method. We were not trained, thus, we could not implement it correctly. In other words, a continuous training so that we can execute this exercised adequate and to the benefit of the learner. Thus, I want this method to continue an there is no need for us to go back to traditional method of training [BT3].*

> *This ERT method is good however, it pressured us to it without adequate knowledge. To use a new system, one need to be trained. Similarly, we were supposed to be trained to use these digital tools for classroom practice. I am against the idea that it is temporary, but it should be an alternative way of teaching since we are living in the world of digital technology [CT5].*

Participants believe that in this day and age of digital technology, ERT is a good alternative method of teaching. They support the idea that ERT should not be terminated abruptly, but should continue under a different name, such as 'online,' or another name that is appropriate for the digital era. The main concern is that the Department of Education should provide professional training programs for educators so that they can effectively or correctly implement new methods of teaching and learning.

For example, when the CAPS curriculum was introduced in 2012, teachers were adequately trained to implement the new curriculum. Similarly, when a new teaching method, such as ERT, is introduced, teachers must be trained in the same way that the CAPS curriculum was.

4.7 Analysis of the Findings

Thematic analysis was used to analyse presented data to identify repeated patterns. Thematic analysis is a method used for describing data, but it can also involve interpretation in the processes of selecting codes and constructing themes. Before delving into the specific steps of thematic analysis, it is vital to identify what a theme is. A theme is a patterned response or meaning derived from the data the informs the research questions (Braun and Clarke, 2006). It also provides description and organisation to manifest content of a data set. Thus, a theme is a more abstract entity that involves a greater degree of interpretation and integration of data. (Nowell *et al*., 2017). In this study the themes were identified after a thorough analysis of different chunks of the data. Going through the participants' transcripts helped in highlighting important sections that were relevant to the research questions. Thus, the two following themes strongly appeared:

- Lack of professional development and technical support
- Willingness to continue using ERT as alternative teaching as teaching.

4.8 Lack of professional development and technical support in ERT

Participants demonstrated dire need for re-skilling towards using digital technologies in pedagogical spaces. They claimed that for successful integration of digital technology tools in the classroom practice, teachers need to be proficient on how to use digital technologies for teaching purposes. Enakrre (2019), mentioned that it is essential for teachers to be trained on how to use ICT related resources to become a better user of that resource. Such trainings and support programs offered to teachers help to improve pedagogical deliveries in the classroom. Reskilling should be a continuous existing phenomenon in the education sector because of digital technology disturbances and thus, teaching professionals require be exposed to ever evolving technological digital tools. Embracing continuous acquisition of knowledge and skills to navigate and sustain dynamism in the teaching space is now a necessity. The training that teachers must have include the competencies portrayed in the use of LMS, using internet to search for relevant information, downloading YouTube videos and dealing with technical glitches. When exposed on how to deal with the above-mentioned scenario, teachers can contribute in a large way in teaching that is already dominated by use of technology.

Providing technical support is a necessity as teachers may face some technical glitches often disturbing smooth running of the lesson and also creating frustration to both teachers and learners.

Education system has changed and to promote proactive teaching practice, teachers should have the ability and capability to use technology for comprehensive teaching and learning environment (Ghavifekr *et al*., 2015). Despite the fact that Department of Education had donated computers to schools teachers still face some challenges on how to integrate these tools in their teaching due to lack of continuous development. Van der Berg *et al*. (2011), state that "with curricula innovations which include teacher training in the use of technology for advances and better performance in teaching and learning in the remote environments" (p. 2), may help teachers to embrace technology in their classroom practice. In addition, Garcia *et al*. (2021), indicate that there are many different options for digital technologies that can be used for ERT, just as there are many different options for pedagogical approaches. Learning contexts, such as internet, social media technologies, LMS and apps can be used to facilitate seamless teaching and learning.

4.9 Willingness to continue using ERT as alternative teaching as teaching.

Participants are of the opinion that the ERT should be here to stay. Most participants showed eagerness to use this method to maintain educational continuity, as it is relevant in this 21st century. The only drawback was that it was introduced in a rushed environment and there was absolutely no planning on how to implement it. Given the vastly different digital infrastructure in different schools as well as individual knowledge, it was no surprise that the participants will experience the diverse skills towards the use of digital technologies in their teaching practice. Stewart (2021) noted that while experiences with ERT have been diverse and complex, they have been positive sides. He found that digital learning had improved learning outcomes for learners in big way. Teachers were able to adapt quickly and successfully. However, in this study teachers faced challenges after challenges predominantly from their lack of planning towards the use of ICT. Participants are of the perception that the ERT should continue and not stop because of the nature it was introduced. A new name or reconceptualization of ERT is vital as we are living in the world dominated by the use of digital technologies. The participants perceptions of ERT are flexible and they show understanding of digital technology changes, that need to be applied in the classes and curriculum. Though some teachers and learners still prefer face-to-face learning, digital tools platforms positively impact learning in a greater way. Teachers need to change their mindset or view teaching in this era different from yester years as the world is already flooded with digital technologies.

4.10 Discussion

The study investigated teachers' perceptions on the use of ERT and its future existence. Research questions were used to arrive on the conclusive matter about how teachers feel with regard to ERT as a future instructional mode of teaching. Below is the response to each question:

1. *How do teachers place ERT as a possible future teaching opportunity for pedagogical instructions?*

Teachers expressed optimism about ERT as a feasible style of instruction because modern learners use and live with digital technology. Learners are more interested in what technology can do for them than in what technology can do for them. When learners take an active role in their learning, their motivation rises, and their capacity to explore the digital world places them in possession of their learning capacities. Teachers, on the other hand, were clear that they continue to confront problems in incorporating digital technologies into their educational activities.

2. *What teaching strategy should teachers preserve during ERT to cater for diverse learner needs?*

Teachers demonstrated the need to shift away from teaching ideologies such as behaviourism and cognitivism and toward a philosophy that welcomes technology in this digital age. Unfortunately, teachers lack the motivation to use technology into their classroom instruction. They believe that receiving professional development in the integration of digital technology in teaching and learning will help them to continue utilizing ERT as an alternative teaching technique, and if possible, it will be reserved for future teaching instruction.

3. *What technological pedagogical abilities do teachers need to adopt ERT as a future acceptable way of content delivery*

Teachers argued for extensive training in the use of digital technology in the classroom. Teachers must have the abilities and knowledge to integrate technology into their various disciplines in order to accept ERT as a future content distribution method. Their existing experience in the digital technology arena is minimal, which makes it difficult for them to successfully integrate technology in their classrooms. They see technology as a viable option in this day and age because it is rapidly evolving and has an impact on our educational system, affecting both teachers and learners.

4.10.1 The main research questions

How should teachers regard ERT as a potential future instructional mode that can generate high-quality instruction and desired educational outcomes?

Teachers demonstrated a desire to adopt ERT as an approach that may be used indefinitely as long as they remain in the digital age. As the "digital born" generation, learners born in the 2000s have different ways for learning digital material. They spend their entire lives surrounded by digital culture, which encourages them to use and experiment with digital tools. If teachers are properly trained in the use of digital technologies in the classroom, there is a chance that they will incorporate them into their practice and provide the appropriate educational outcomes as needed by the department of education.

This research was guided by the ERT framework, which included characteristics such as readiness, attitudes, satisfaction, perceived effectiveness, and anxiety. It aided the researcher in developing research questions and accomplishing the study's objectives. All of these concepts were expressed in some way by the teachers. For example, teachers claimed that they were not fully prepared to use ERT techniques of teaching since they had not been taught. They demonstrated a positive attitude toward the use of ERT because learners live in a world surrounded by digital tools. They expressed a strong belief that if they acquire training that provides them with the essential skills (satisfaction), they will be able to be highly effective in their lesson delivery using technology. In general, when teachers are adequately trained on how to use digital technology in their classrooms, there is a good chance that their anxieties will be minimized because they will be doing something they are acquainted with. Thus, teachers believe that the ERT should not be viewed as a band-aid solution to the current crisis, but rather as a way that teachers can apply in this digital age. Learners are of the "digital generation", which means they expect digital technology to be used in their teaching and learning.

4.11 Conclusion

This chapter presented information gathered from participants. Data was classified, and participant information was organized into categories and thematically analysed. The study's key themes were a lack of professional growth and technical assistance, as well as a readiness to continue using ERT as an alternate teaching method. The core research question, as well as the sub questions, were

addressed. The ERT paradigm was utilized to drive the research, with the goal of encouraging instructors to employ digital technology in their classrooms. The readiness, attitudes, satisfaction, perceived effectiveness, and anxiety characteristics define the framework. These aided the researcher in creating research questions and achieving the aims of the study.

Chapter 5: Conclusion, Limitations and Recommendations

5.1 Introduction

In this chapter the conclusion of the study is highlighted based on the aim of the study research questions and the results. The findings of the study are highlighted to ensure that the main aim of the study is reached. In addition, limitation, and recommendation of the is also explained.

5.2 Conclusion

The study focused on encouraging teachers to think differently about the use of ERT as a future instructional mode and or option that results in high-quality education and desired outcomes. During the recontextualized ERT, teachers urged that this mode of teaching should be continued used during classroom practice. Teachers suggested that they should continually get professional training in the field of digital technology as it evolves in order to ensure that ERT is brought to new heights. The main issue was that teacher were to abruptly shift from face-to-face to online teaching due to covid-19, they had no choice but to implement the method that they were unfamiliar with. Majority of teachers were caught unready, implementing a system that they had little knowledge about it. The main research question was to find out how teachers should regard ERT as a potential future instructional mode that can generate high-quality instruction and desired educational outcomes. The study found that teachers are keen to continue using ERT as a method of teaching in this contemporary digital era, provided they receive proper training towards digital technology terrain. The literature revealed that teachers are not yet ready in using technology for pedagogical instruction. The study used a qualitative method approach with six participants from township schools. Semi-structured interviews were used to gather data that was used thematically. ERT framework (Section 2.16) was used to guide the study. The data revealed two key themes, that is, lack of professional development and technical support, as well as a readiness to continue utilizing ERT as an alternative teaching method, despite teachers' low degree of integration of digital technology in the classroom. Teachers believe that ERT should not be viewed as a one-time answer to teaching and learning. Instead, it should be brought to higher levels of teaching pedagogy. The proliferation of digital devices that students utilize on a daily basis has an impact on them. They anticipate that digital technologies will be used to facilitate education.

5.3 Recommendations

For ERT to be viewed as an alternative instructional digital pedagogy, the following are recommended:

- Professional development, systematic and continuing training to improve both teachers' and learners' technology abilities is required when integrating technology in the classroom. Teachers should obtain continual digital technical training to enhance their competences and improve their virtual teaching practices in the absence of face-to-face teaching and learning.
- When using the ERT, it is critical to have access to suitable digital technical instructional tools. The department of education should supply digital tools to both primary and secondary schools so that teachers can begin using these tools when teaching students at a young age. Furthermore, the availability of dependable network infrastructure is required to ensure the seamless operation of the instructional sessions, as these digital tools rely on consistent connectivity.
- Teachers should provide pedagogical instruction targeted to the individual subject that they use to teach using Learning Management Systems. Additionally, teachers should be provided with technical support to assist with system administration and day-to-day operations.
- Technical support is a must-have entity for schools. One of the hurdles that teachers confront while using digital tools to teach is technical issues. To avoid disruptions in the classroom, school-based technicians should be present whenever technical problems arise.
- Teachers should be innovative after receiving training on how to educate utilizing digital tools for remote instruction. Teachers should avoid a dependent mindset in which they expect to be spoon fed all the time. They may learn how to do new abilities on their own once they have acquired computing skills.
- Departmental learning communities are practices in which employees and the greater community collaborate to achieve shared, substantial academic goals in environments where competition, if not non-existent, is at the very least deemphasized. Teachers have a variety of digital technology abilities that they can share as a department as a team.

5.4 Limitation of the study

One of the limitations of this study is that it focused on township schools in Gauteng province that have computer laboratories. These laboratories are used as for teaching CAT and on a limited scale, teachers from other departments can come and prepare their teaching materials. Teachers from schools without computers were not part of the research, thus limiting the information that could have given a better picture on how teachers view ERT. Due to limitations imposed by the department of education when collecting data from schools, it was not possible for this study to interview teachers and HOD's about the challenges their respective schools faced. Data collection is permitted through the third term, according to the department of education. Therefore, the researcher had to collect data before the end of third term, the researcher had to substitute other participants, because of those who cancelled due to other commitments. More research on whether ERT improves pass rate should be conducted as a separate study. This study was not inconclusive in confirming that ERT does, in fact, improve the pass rate. It should also be mentioned that the study only included schools with GDE-provided ICTs. As a result, private and public schools not funded by GDE were excluded from the study. Their presence could have resulted in a different outcome. Finally, the study did not include all stakeholders in the schools studied. Principals, deputy principals, learners, and parents, who may have been a wonderful source of knowledge and more knowledgeable than the teachers, were not included in the study. Nonetheless, the limitations mentioned have no bearing on the study's validity and reliability. Highlighting these shortcomings can help to suggest future routes for study and implementation of new results.

5.5 Further research could focus on the following topics:

- How to ensure that quality teaching is maintained in Remote learning.
- Reconceptualization of Remote learning and teaching inclusivity in township schools
- Examine the difference between ERT, online learning and blended learning

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Appendix 1: GDE Approval Letter

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**22 April 2022**
Validity of Research Approval:	**08 February 2022– 30 September 2022** **2022/155**
Name of Researcher:	**Nyalunga NL**
Address of Researcher:	**336 Masakhane Street Ngema section**
	Katlehong
	Germistorn
Telephone Number:	**083 394 2186**
Email address:	**604596@students.wit.ac.za**
Research Topic:	**Reconceptualization of Remote Teaching and its affordances: A case study of Township Secondary Schools in Gauteng**
Type of qualification	**Master of Education**
Number and type of schools:	**3 Secondary School**
District/s/HO	**Ekurhuleni South**

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

25/04/2022

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below are met. Approval may be withdrawn should any of the conditions listed below be flouted:

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

1. *The letter would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*
2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. ***Because of the relaxation of COVID 19 regulations researchers can collect data online, telephonically, physically access schools, or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate.***
4. ***The Researchers are advised to wear a mask at all times, Social distance at all times, Provide a vaccination certificate or negative COVID-19 test, not older than 72 hours, and Sanitise frequently.***
5. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s has been granted permission from the Gauteng Department of Education to conduct the research study.*
6. *A letter/document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs, and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
7. *The Researcher will make every effort to obtain the goodwill and cooperation of all the GDE officials, principals, and chairpersons of the SGBs, teachers, and learners involved. Persons who offer their cooperation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.*
8. *Research may only be conducted after school hours so that the normal school program is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.*
9. *Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.*
10. *Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.*
11. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
12. *The researcher is responsible for supplying and utilising his/her research resources, such as stationery, photocopies, transport, faxes, and telephones, and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.*
13. *The names of the GDE officials, schools, principals, parents, teachers, and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.*
14. *On completion of the study, the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
15. *The researcher may be expected to provide short presentations on the purpose, findings, and recommendations of his/her research to both GDE officials and the schools concerned.*
16. *Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a summary of the purpose, findings, and recommendations of the research study.*

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

.....

Mr. Gumani Mukatuni
Acting CES: Education Research and Knowledge Management

DATE: 25/04/2022

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

Appendix 2: Ethics Clearance

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG | WSoE Wits School of Education

SCHOOL OF EDUCATION ETHICS COMMITTEE

CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: 2022ECE019M**
PROJECT TITLE	Reconceptualization of Remote Teaching and its affordances: A case study of Township Secondary Schools in Gauteng.
INVESTIGATOR	Nomathemba Lindokuhle Nyalunga
SCHOOL/DEPARTMENT OF INVESTIGATOR	WSoE
DATE CONSIDERED	20 MAY 2022
DECISION OF THE COMMITTEE	**APPROVED CONDITIONALLY**
RISK LEVEL	MINIMAL RISK
EXPIRY DATE	Date of submission of the Research Report
ISSUE DATE OF CERTIFICATE	**CHAIRPERSON** Dr. Batseba Mofolo-Mbokane

cc: Dr. Alton Dewa

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature _____ **Date** 07/07/2022