INVESTIGATING TEACHERS' POST-PANDEMIC MANAGEMENT OF MATHEMATICS CONTENT COVERAGE IN GRADE 3

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ABSTRACT

This study investigated how teachers managed and continue to manage mathematics content coverage in Grade 3 during the COVID-19 pandemic and now post the pandemic. In particular my study sought to understand technologies that teachers may have drawn on during the pandemic in support of curriculum coverage and those that they continue to use. In addition, the study began with a detailed documentary analysis of all available documentation provided to schools and teachers about the management of teaching and curriculum coverage during the pandemic as this provides understanding of the policy and guidelines context in which teachers were working.

Thus, in this research I investigated the research questions: i) How have teachers managed the stipulated curriculum coverage in Grade 3 mathematics during the pandemic? and ii) How are teachers continuing to manage this post the pandemic. This included identifying how much and what type of support teachers were given from various stakeholders in the primary education system. Here the levels of support from school principals, governing bodies and more importantly the Department of Basic Education were analysed.

This research, situated within an interpretative paradigm, was guided by the sociocultural theory inherent in the concerns-based adoption model. The levels of use within the concerns-based adoption model were adapted to suit the South African context of the study. Participants of the study were 18 teachers from different quintile schools within the Tshwane South District.

Key findings included that the Department of Basic Education (DBE) provided a range of documents aimed at adjusting content coverage in response to the altered school calendar during the pandemic. Notable adjustments, particularly in the Annual Teaching Plans (ATPs) of 2020, revealed discrepancies in allocated school days and modifications in content areas such as numbers, operations, geometry, measurement, and data handling. The reduction in the number range and fluctuations in measurement components were observed. Despite the provision of guidelines, the study notes challenges in maintaining continuity and optimal learning, with indications of non-compliance with provided ATPs.

The study further found that teachers in different quintile schools adopted diverse strategies for mathematics content coverage during the pandemic. Quintile 5 schools, often well-resourced, reported effective remote teaching using tools like PowerPoint and MS Teams. In contrast, teachers in quintiles 3 and 4, more impacted by school closures, employed varied methods,

including extra lessons. Surprisingly, teachers in well-resourced private schools reported gaps in learners' mathematical knowledge, emphasizing the flexibility they have in curriculum coverage.

Technology played a pivotal role in facilitating remote teaching during the pandemic, with tools like WhatsApp, MS Teams, and Zoom being widely used, where available. The study underscored the impact of technology on curriculum coverage, especially in well-resourced schools.

Grade 3 teachers expressed challenges in meeting unrealistic expectations for curriculum coverage, citing gaps in learners' understanding. The study highlighted a discrepancy between the resources provided by the DBE and the actual needs on the ground, signalling a need for policymakers to become more understanding to the situations in schools. The lack of support from the DBE prompted teachers to become flexible, adapting teaching strategies and supporting each other to navigate the challenges posed by the pandemic. The study concludes by noting the evolving mindset of teachers, transitioning through different levels of Concerns-Based Adoption Model (CBAM), ultimately showcasing their resilience and adaptability in managing curriculum coverage with the available resources.

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DECLARATION OF ORIGINALITY

I know that plagiarism (using another's words and pretending that they are my own) is wrong.

I, Inge Damaske, therefore, declare that this assignment is my own work written in my own words. Where I have drawn on the words or ideas of others, these have been acknowledged using complete references according to Departmental Guidelines.

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(Signature) (Date)

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CHAPTER I: INTRODUCTION, RATIONALE AND CONTEXT OF THE STUDY

1.1 Introduction

COVID-19 caused massive changes to education around the world. Priyadarshani and Jesuiya assert that "change is continual and irreversible" (2021, p. 132). This is further supported by Harari who states that "change is the only constant [in life]" (2018, p. 231). Despite these philosophical observations, the pre-service teacher education received by current practicing teachers may not have adequately equipped them for the unexpected changes of the past few years. Consequently, understanding the support teachers require to navigate such changes becomes crucial in maintaining the quality of mathematics teaching and learning.

1.2 Contextual Background

On the 18th of March 2020, South African schools were instructed to close in an attempt to curb the COVID-19 pandemic. What initially seemed like a quick fix resulted in a loss of up to 83 school days for Grade 3 learners in 2020 (DBE, 2020i). Schools in the public sector, specifically quintiles 1-4, were affected the most, lacking the means to conduct lessons online and relying on the Department of Basic Education for resources and guidance. Many of these schools faced pre-existing issues, such as overcrowding, resource shortages, and a lack of quality teaching. These challenges were exacerbated by the insufficient support they received during the pandemic, and several schools remained closed until rotational learning was permitted in August 2020.

Upon the reopening of schools on a rotational basis,[1] numerous learners did not return as planned and fell behind in their education. While teachers in some schools attempted to distribute work to learners through platforms like WhatsApp or learning packages, many students were still left without access. Private schools and quintile 5 schools, with internet access and more resources, were able to continue their lessons remotely with support from their schools and resources made available by the DBE.

During the COVID-19 pandemic the Department of Basic Education published many resources on their DBE platform, such as the CAMI APP and Math Doodle (Department of Basic Education, 2020) that could be used in an attempt to bridge the learning time outside of schools. Many of these resources, however, required functioning electricity, smart phones, and a stable internet connection (Department of Basic Education, 2020). Access to the internet and functioning

[1] This meant that classes were split into smaller groups (depending on class size – either 2 or three groups) to allow for social distancing while attending class. Each group attended lessons on alternating days.

electricity is not available to everyone in South Africa, making it difficult for many learners to make use of TV- broadcasted lessons or using websites provided by the Department of Basic Education. The lack of access to the internet denies learners the opportunities for "communication, learning and development [leaving] learners in [especially rural areas] behind" (Dayimani, 2021). In addition, Setati (2003) argues that a lack of qualified educators to teach computer literacy and security issues, such as resources being stolen, further constrain the long-term prospects of computer and internet literacy in public schools. Fares et al. state that just under 40% of schools, mostly private, have computers available in their classrooms (2021)

Cassim (2021) mentions that the impact of COVID-19 has highlighted the importance of having schools and learners connected to the internet. Many teachers in South Africa have, however, not received formal training in the use of technologies in the classroom or in the use of blended learning, which made the move to online learning in South Africa extremely difficult during the COVID-19 pandemic (Jantjies, 2020). A recent study done at the University of Stellenbosch, found that a learning loss with marks dropping an average of 10% in Grade 3 "core content area of number operations and relationships" was experienced between 2019 and 2021 (Le Grange, 2021, p. 14). Since this drop is already of a concerning low base and Grade 3 forms the last year of primary education, one needs to evaluate the impact of such loss of learning. The question arises how and if teachers are able to manage [2]the content coverage with the help of strategies that they might have used during the hight of the COVID-19 pandemic.

1.3 Rationale

I conducted this research because of my passion for teaching mathematics in Grade 3 and the challenges I encountered in ensuring continued quality teaching during the pandemic. I was personally affected by the sudden instructional change brought about by the COVID-19 pandemic. Like many other teachers around the world (König et al., 2020), I was compelled to create online lessons for learners who had limited knowledge of the internet and computer usage. The interest in this topic stemmed from a curiosity to determine whether all teachers received the same level of support from their schools and the Department of Basic Education, and how teachers experienced and managed the sudden change. I investigated how teachers coped with and are coping in the "new normal" (Chan et al., 2021, p. 4) in both a pandemic and post-pandemic setting.

[2] Bush & Bell (2020) define curriculum management as a process that includes four steps: planning, implementing, monitoring and reviewing the curriculum content.

I explored whether teachers are utilizing skills acquired during the pandemic to assist learners in catching up on lost learning time.

In informal discussions with colleagues, I found that most teachers felt overwhelmed by the challenge of adjusting to the imposed restrictions in their personal and professional lives. They also felt the pressure to provide care to their learners in a different setting - on digital platforms instead of in the conventional classroom (Priyadarshani & Jesuiya, 2021). The question arises as to whether the loss in teaching time (Fricker, 2021) necessitates a revision of the current curriculum content or if the adaptation of the curriculum has highlighted areas that are no longer relevant for the "new normal" for the post-pandemic setting.

In September 2020, the Department of Basic Education announced a "comprehensive catch-up plan [...] to make up for lost teaching and learning time due to the lockdown" (Mokoena, 2020, p. 1), recognizing that the loss in teaching time could have long-term effects such as "an increase in dropout rates when these [primary school learners] reach Grades 10-12" (Motsheka, 2021, p. 7). It is likely that as these learner's progress to higher grades, the foundational gaps created during the COVID-19 pandemic will become more significant.

1.4 Statement of the problem

COVID-19 forced teachers worldwide to change their way of teaching overnight. Many teachers did not receive training, support, or the necessary equipment to teach online successfully (Jantjies, 2020) or to adapt to 'distance' learning without face-to-face teaching. Furthermore, many students, especially in South Africa, did not have access to the material provided by the Department of Basic Education or teachers due to a lack of infrastructure such as computers or internet access (Guruli et al., 2020). The COVID-19 pandemic placed numerous demands on teachers, leaving them feeling overwhelmed yet pressured to continue teaching and supporting their learners. They were aware that most learners were also overwhelmed by the pandemic itself or lacked the required infrastructure to participate in remote lessons (Yang, 2020). To address this, many teachers resorted to using platforms such as WhatsApp, Zoom, or Microsoft Teams to support their learners from a distance, aiming to prevent learners from missing essential learning content (Jantjies, 2020). Already overwhelmed, teachers were now tasked with investing more time to make up for lost teaching time, with many still not having most of their learners back in the classroom. Jantjies (2020) suggests that, moving forward, the education system should focus on developing an "e-

learning ecosystem" to support teachers, learners, and parents, aiming to minimize future disruptions in learning time.

To further this investigation, I conducted a qualitative study that primarily aimed to explore how Grade 3 teachers managed during and post-pandemic mathematics content coverage. My research contributes knowledge of teachers' experiences to the field and informs possible future ways forward for supporting e-learning and possibilities for post-pandemic curriculum coverage. To inform this, I gathered data on, and analysed, how teachers managed content coverage during the pandemic. Furthermore, I investigated how teachers experienced the use of digital platforms as an "emergency remote [teaching method]" (Song et al., 2020) during the COVID-19 pandemic to identify gaps in the education system that require further development of e-learning platforms, specifically in South Africa. Lastly, I hope to identify possible tools that teachers might use that have emerged from the remote teaching environment.

1.5 Research questions

The main question guiding my research was:

How did Grade 3 teachers manage curriculum coverage during the pandemic and how are they managing this currently in the post-pandemic context?

The sub-questions included:

a) What policy and documentation were provided to schools and teachers about teaching and curriculum coverage during the pandemic?
b) How did teachers manage mathematics content coverage during the pandemic?
c) How were teachers supported (if at all) by the DBE or schools to manage continued teaching and learning during the pandemic?
d) How are teachers managing mathematics content coverage currently? And what pandemic emergent strategies are teachers continuing to use in their current practice?
e) What role did/does technology play in b, c, and d?

1.6 Aims of the study

The aim of the research was to:

- Investigate the DBE response to the pandemic in terms of advising teachers on continued teaching and learning policies and strategies.

- Investigate how teachers taught the content of the mathematics curriculum during the hight of the COVID-19 pandemic.
- Investigate how teachers are managing the mathematics content in the post-pandemic classroom.
- Investigate what teaching tools and methods have teachers used during the pandemic that they are still using the post-pandemic classroom.

1.7 Research design

To understand how teachers managed the content coverage of the Grade 3 mathematics curriculum during and post COVID-19, a qualitative approach was used. The study utilized three distinct data collection methods: document analysis, questionnaires, and follow-up interviews.

A qualitative approach to this study, was chosen as the aim was to explain a current situation, naming the way in which teachers managed to cover the mathematics curriculum content in grade 3 (Lowhorn, 2007). Qualitative data describes events in their natural setting having a subjective view of life as experienced by the participants (Abusabha & Woelfel, 2003).

A documentary analysis was conducted on all available data provided to teachers by the DBE between March 2020 and May 2022. The documents were categorized based on themes that emerged from the data. Subsequently, a detailed analysis was done on the ATP's made available to teachers, comparing them to the CAPS (2019) document to better understand the curriculum adjustments.

Following this, teachers were invited to take part in a questionnaire, with 18 teachers from seven different schools in Gauteng taking part. The questionnaire aimed to gather data aimed at a general understanding of how teachers managed the adjusted curriculum and the support they received for teaching mathematics during the pandemic. Additionally, six teachers participated in more in-depth interviews. The interview questions were semi-structured and were derived from the teachers' responses in the questionnaire. This allowed for further probing of aspects reported on in their questionnaires. A thematic analysis was conducted on the questionnaire data, supplemented with insights from the interviews.

CHAPTER II: LITERATURE REVIEW

2.1 Introduction to the Literature review

In this literature review I highlight current research that is related to the topic of teaching mathematics in primary schools and curriculum adjustments (particularly in relation to suggested reductions in content coverage and stipulation of priority content areas) for distance and online learning with a focus on developments since the onset of the COVID-19 pandemic. In chapter I, as part of the introduction to, and rationale of, the study, I outlined some of the South African context of mathematics education in which the study is taking place. Here I expand on this and begin by highlighting the impact of the COVID-19 pandemic on education internationally and in the South African context. Next, I will review literature related to the motivation and need for increased online and/or at a distance learning and how this connects with the South African context of supporting mathematical curriculum coverage post COVID-19. I will also engage with issues of teacher knowledge and school resources required to benefit from online learning opportunities and 'distance learning' resources that impact on student learning, as well as understanding what is meant by "teachers management of the curriculum". Lastly, I will discuss the nature of the various communications provided by the Department of Education regarding teaching during the pandemic and particularly focus on their communications in relation to teaching of mathematics in a post-pandemic classroom. These are discussed at a general level in the literature review as they will be analysed in detail in Chapter IV when responding to the research question focused on document analysis of all available documented communications sent by the Department of Basic Education across various platforms from March 2020 to date.

2.2 Impact of COVID-19 on education internationally and locally

This study takes place within the South African context and as such some overview of South African primary mathematics is important. Between 2015 and 2019 South Africa has scored on average 8 points worse in the different mathematical areas by Grade 4 on the TIMSS scores (Mullis et al., 2020) with some of the highest performance gaps in mathematics between the different school quintiles. The 2012 Annual National Assessment (ANA) showed that "only 36.3% of Grade 3 learners nationally achieved more than 50% for the ANAs" (Graven et al., 2013, p. 134). The same study found that learners are being pushed into the intermediate phase without having grasped the foundational knowledge needed for higher grades. The pressure to complete the curriculum does not allow for teachers to address the backlog and to give the necessary assistance. As Graven et al. (2013) mention in their research, the "absence [of certain topics] in assessments,

where assessment often drives teaching, is problematic" (p. 131). Since the last ANA was written in 2016 and no national assessment has replaced it, there is little knowledge of the backlog that COVID-19 has truly left on schools around South Africa.

With the global onset of the COVID-19 pandemic, teaching worldwide has been forced to transform and shift to alternative teaching for learning overnight (Gorey, 2020). With the outbreak of the virus, the World Health Organization (WHO) warned that the "global community [was] not yet ready, in mindset and materially, to implement the measures that have been employed" (2020, p. 19) to combat the COVID-19 pandemic. This can be said for various parts of the world community; both on the health and the educational front. Everyone had to adjust without the knowledge of how severely the virus would affect the community and how long COVID-19 would be with us. More than 193 countries around the world had closed their schools by April 2020 (Shepherd & Mohohlwane, 2021). Most countries around the world kept their schools closed for an average of 34 weeks (UNESCO, 2021) making the education sector the most affected by the pandemic after the medical sector (Rotnisky et al. 2022).

Although the closing of schools in South Africa on 18 March 2020 seemed to be a quick fix to stop the spread of the Corona Virus (Isilow, 2020), it became clear that alternative schooling would need to be considered as the pandemic would affect opportunities for face-to-face teaching for a while to come. People were instructed to change their behaviour, isolate themselves from the outside world and only leave their houses for the bare necessities (Isilow, 2020; WHO, 2020). The so called "quick fix" lockdown in South Africa then turned into a prolonged 740 days (South African Government, 2022) of ongoing changes in COVID-19 regulations and related changes in regulations for schooling.

In the extreme lockdown stages all South African schools were physically closed with only some schools being able to make the transition to teaching being "undertaken remotely and on digital platforms" (Li & Lalani, 2020). In South Africa "just 6% of youth aged 5–24 (were) participating in remote learning in 2020" (Wills & van der Berg, 2022, p. 6). Willis and van der Berg further found that on average 54% of learning time across the grades was lost during 2020 and another 22% of learning time was lost in during 2021. The pandemic thus called for an adaptation of how to continue teaching and learning through a time frame "where the home became a critical site for learning" (Vale & Graven, 2022, p. 514).

During the COVID-19 pandemic high levels of learning losses and learner dropouts from school were experienced in countries all over the world. Onyema et al. (2020) added that if learners were not engaged in productive activities, they might develop a loss of interest in school, show poor academic performance and even get involved in youth crimes. Shepherd & Mohohlwane (2021) assert this in their study that a decrease of about 5%, (which translates to about 700 000 children) in learner attendance in schools across South Africa was observed by May 2021 and by term three of 2021 only 45% of Grade 3 learners had returned to school (Wills & van der Berg, 2022). Similar results were reported in countries with similar resource challenges and populations where the majority of learners live in poor or poverty circumstances. UNESCO (2021) emphasised the increased impact on vulnerable leaners and stated, that "prolonged and repeated […] school closure […] have resulted in […] increased drop-out rates, impacting the most vulnerable students disproportionately" (p. 1). This was confirmed by Wills & van der Berg (2022) who found, rather unsurprisingly in their study, that learners in low-to-middle income countries experienced a larger learning loss and learner drop-out rate than higher income countries. This was due to various reasons with some noted by Chan, Sabena & Wagner (2021) as being unequal access to internet, computer and other devices, availability of space at home, uninterrupted time and other responsibilities in the home that required time. Webster (2021) added that a positive home learning environment and significant parental input was needed for learners to effectively take part in distance education. In South Africa only about 8% of learners had access to the internet to be able to take part in online or remote lessons (Shepherd & Mohohlwane, 2021). With a high number of learners being left without any means to access remote teaching opportunities, there was little control from teachers to assist learners from a distance. Therefore Rotnitsky et al. (2022) found that teachers in primary schools would prefer to go back to face-to-face teaching as it was more difficult to follow leaners progress during distance learning.

The Centre for Development and Enterprise (CDE) (2023) in their study across South Africa found that the average 4th Grade learner knows less than a Grade 3 learner did prior to the pandemic. Since Wright (2013) found that learners basic math skills by Grade 1 predict their mathematical success by the time they reach Grade 5 this reduced knowledge in the early grades is concerning. It is likely that the learners that have been in Grade 1 during 2020, who missed most of their learning time have thus been set up for failure, lacking enough number sense and understanding of quantities to progress. Aubrey et al. (2006) concur about the importance of early establishment of foundational knowledge stating that learners with little mathematical knowledge at the beginning of their formal schooling "will remain low achievers throughout their primary years

and, probably beyond" (p. 27). In this respect it becomes important to understand the increased learning challenges faced by early grade learners as a result of the pandemic and to look to the extent to which opportunities or suggestions for enabling curriculum coverage and 'catch-up' are being used.

Increasing opportunities for at home learning opportunities whether through physical take home materials or online ICT based resources becomes essential — particularly since there has been no extension to the length of the school day or school term in South African schools that might have enabled the 'catch-up' to occur within the school day timetable. The need for increased at home and outside of school learning opportunities links to the following section where I discuss the issue of technological support for mathematics learning and the issue of inequality of access to such opportunities. This is especially pertinent in the case of South Africa which has one of the world's most unequal societies and one of the greatest performance gaps in mathematics assessments between wealthier and poorer learners where providing quality education to all learners remains one of the biggest challenges since the start of democracy in 1994 (Graven, 2014).

2.3 Use of technology and inequality

Online learning, a "general concept of learning and teaching with the help of technological tools" (Rotnitsky et al., 2022, p. 20), has developed rapidly in the past 30 years with content being broadcast on radio, television and with the use of computer-based learning (Onyema et al., 2020).

Internationally online learning or e-learning has been promoted since 1990 (Song et al., 2020), however, many obstacles remain for online learning to function properly particularly in developing world countries. South Africa devotes about 13% of its government revenue to basic education but still performs well below other low- and middle-income countries, showing that its spending is ineffective (Schirmer & Visser, 2023).

Song et al. (2020) and Priyadarshani and Jesuiya (2021) have identified several key barriers that hinder online or open distance learning in the primary sector, one of which is the teacher's willingness to record e-material and their lack of guidance in this regard. Keiler (2018) agrees with this statement, further stating that many teachers feel threatened, as their role in the learning process changes from facilitating learning (in face-to-face interactions) to supporting learning (without being face-to-face with learners in a classroom). Teachers' and learners' attitudes and expectations of online learning, play a vital role for motivation and learning to be successful

(Priyadarshani & Jesuiya, 2021). According to Higgs et al. (2010), online learning emphasizes the relationship between teachers and learners as well as learners and content.

Education ministries all over the world have been encouraging the use of computers in the classroom to enhance the quality of teaching and to develop learners' information technology skills (Bradley, 2003). Harari (2018) calls for a reform of the current school curriculum to include information that is more relevant and to teach skills that will matter in the next 50 years. This is supported by Ramrathan (2020), who argues that the current South African curriculum focuses on content coverage at the expense of the learners understanding the content.

2.3.1 Technology as a tool in a response to COVID-19

The focus of content coverage over learning understanding can especially be seen in the Department of Basic Education's response to the COVID-19 pandemic. Learners in public schools lost up to one school year in teaching time (Fricker 2021), creating an ever-bigger gap between the different quintile schools. This was acknowledged by the Minister of Education, Angie Motsheka, who mentioned that "loss in teaching time could lead to long term learning loss and increase the inequality in learning outcomes" (2020) between the different quintile schools.

The way in which some independent schools have responded to the COVID-19 pandemic has shown promise for the way in which technology can help transform ways in which teaching and learning take place (Spencer, 2020). In collaboration with Intel, the DBE released a guide to e-learning for teachers to make use of when transitioning from face-to-face learning to remote and especially e-learning (DBE, 2020a). Vale & Graven (2021) suggest that better technology would have allowed for a smoother transition from face to face to remote learning in all schools. Sadly, this was not the reality in most South African schools for many different reasons that will be discussed here. Even before the pandemic started, there was already a need for growth and a restructuring of education for it to be more technology friendly (Li & Lalani, 2020) and to build on the increasingly powerful learning opportunities provided by these emerging technologies. In a report published by the CDE (2023) it is stated that there is the hope that the COVID-19 crisis would be "an opportunity to reform the education landscape […] with respect of digital or blended learning" (Schirmer & Visser, 2023, p.11). However, the lack of access to technological support, technological equipment required and infrastructure such as high speed and freely available internet hindered such a reform across the country.

2.3.2 Inequality in the response to COVID-19 as a result of the 'digital divide'

This inequality is again highlighted by Guruli et al (2020, p. 10), who mention that "between 14.2 million and 15 million learners did not have access to the internet at school in 2017 [causing a] digital divide" between those learners that have access to the internet and those who do not. During the COVID-19 pandemic, these statistics become even more concerning. In a report on the impact on learning and teaching at the hight of the COVID-19 pandemic Statistics South Africa comments on the amount of learning time that was lost: "Only 11.7% of schools offered remote learning options [in South Africa]." (Maluleke, 2022, p. 12). Of these schools, 14.7% were in urban areas and 7.6% were in rural areas. The report further shows that about 90% of learners in rural areas did not have access to a computer that would have enabled them to participate in distance education, whilst 73% of learners in urban areas were able to make use of their smart phones to assist them where distance learning was offered. This clearly shows that learners in rural areas where again left behind as a result of the "digital divide" (Guruli et al., 2020). This divide was not just present in developing countries but across the world. USA, Europe and the UK have estimated that an increase of about 45% in the curriculum learning gap between disadvantaged learners and those with access to technology (Webster, 2021).

Countries like Morocco, Spain and South Africa made use of mostly low-cost live television lessons that were being broadcast (Zacharia& Twinomugisha, 2020). The same study found that many countries made use of previous sport-dedicated channels to now show educational material, whilst others made use of private broadcasters. These TV channels and radio stations were scheduled to start on the 9th of April and aimed to offer curriculum support lessons to learners of different ages. In South Africa these lessons for FET learners were broadcast on three SABC TV channels and 13 different radio stations (DBE, 2020b; DBE, 2020h). Spaull & van der Berg (2020, 16) reported that all the broadcasted TV- lessons for Grades 10 -12 would only amount to "less than 5% of the instruction time learners would be receiving if they were in school" (p.16). This is assuming that learners watched all available lessons for their grade and subject. Additional lessons were shown via satellite and decoder broadcasters for learners between Grade R-9 (Sheperd & Mohohlwane, 2021). However, radio, TV and zero-rated[3] websites still required the user to have access to either a TV, smartphone, or computer, limiting the number of recipients. Although StatsSA (2019) reported that about 60% of South Africans have access to a smartphone with

[3] A Zero-rated website can be accessed by all South Africans without having to pay for the mobile or fixed data (McKane, 2020)

internet access, it cannot be assumed, that learners had access to these phones to be able to successfully take part in online lessons or access zero rated websites that the DBE provided. Furthermore, having a device that can access the internet does not mean that one is able to pay for the access to the internet which is still relatively expensive in South Africa as compared to other countries (Bottomley, 2023).

Learners across all grades in South Africa are now up to other year behind in their education SA News, 2022). This is due to learners having off days when doing rotational attendance, grade specific attendance days and sporadic school closures when a COVID-19 case had been identified. This resulted in school children losing about 54 % of their teaching time between March 2020 and June 2021 when attending the allocated attendance days (Fricker, 2021).

Shepherd & Mohohlowane (2021) substantiate this claim by referencing the findings of Reddy et al.'s (2021) study. According to Reddy et al. (2021), the study forecasts that the already considerable differences in mathematics performance between students in fee-paying and non-fee-paying schools, as revealed in the 2019 Trends in International Mathematics and Science Study (TIMSS), is likely to be further amplified as a result of the COVID-19 pandemic.

2.4 Curriculum coverage and adjustments during and post COVID-19

Curriculum has different meanings in different contexts. In the school context the curriculum is a "blueprint and set of materials that guides students' acquisition of certain […] concepts, procedures, intellectual dispositions and ways of reasoning" (Samara & Clements, 2019, p. 3). Mathematics is a subject where content is learnt and built on progressively and this is evidenced by curricula across the world paying careful attention to the sequencing of curriculum content and a body of research, largely building on constructivist perspectives of learning, paying attention to learning trajectories and learning progressions (Samara & Clements, 2019). This means that if fundamental base concepts are not taught or understood, further learning and higher skills cannot be acquired. Leaners need to move through a developmental progression for them to achieve specific goals. It is important to keep in mind that learning trajectories are not always linear but can assist in learners' acquisition of mathematical knowledge. Graven (2016) has argued that a 'one-size' fits all approach to systemic interventions often makes it difficult for teachers to meet the specific needs of their learners who might, especially in particularly disadvantaged contexts, be several grades behind and thus teaching for grade specific curriculum coverage can be challenging.

Mathematics helps us to organise our life and to understand the world around us. Le Grange (2019) in Brodie et al. (2021) argues that mathematics arises from people's life experiences and should be taught in relation to these. Teachers do, however, need the support of the curriculum and textbooks to be able to successfully link mathematics learning to learners lived experiences and to organise the learning experiences of learners in a logical sequence to support learning progression. When teaching mathematics, we should make use of concrete examples that help learners to connect to their real world such as making building blocks available when dividing and grouping (Meier & Naude, 2018; DBE, 2020d) or by giving context to data shown in graphs (Brodie et al. 2021). Learners were required to learn mathematical skills without the tools to help them solve problem. Silvera-Alarcon et al. (2023) further mention that "mathematical modelling develops problem solving skills based on real environment problems" (p. 157). They go on to say that ICT (Information and communication technology) can be used as an effective tool to enhance learning as it forms a link between mathematical learning and students when available. As previously mentioned, such technologies are not readily available to all learners in South Africa leading to the high divide between learners.

2.4.1 Primary Mathematics in South Africa

Challenges of curriculum coverage and learning lagging behind on Grade level content knowledge have been widely noted prior to the pandemic. Weitz & Venkat (2013) mentioned that mathematical performance in primary schools is decreasing and that learners are performing well below their Grade level expectations. Silvera-Alarcon et al. (2023) found that teachers do not agree with the national curriculum (of Peru), as it prioritises the mathematical content instead of placing focus on developing skills needed to solve problems effectively. If leaners are not given the necessary tools to address and solve problems, they are automatically being left behind. Several researchers have studied the impact of learners' early achievements in mathematics and reading and that this success can predict and have a significant impact on the learners overall scholastic success (Wright, 2013). The same study emphasises the importance of ensuring that learns understand quantities and numerals.

One of the biggest challenges is that number problems are still being solved using unit or one-to-one counting, even when working with larger numbers in higher Grades (Weitz & Venkat, 2013; Graven, 2016). Further studies show that learners are not making use of mental mathematics during their assessments although the curriculum allocated at least 10 minutes to the start of each mathematics lesson to mental maths (Graven et al., 2013). Spaull & Kotze (2015) found that

learners by Grade 4 are already up to 4 years behind their expected level of mathematical competence. One possible reason is, as previously mentioned, that learners to not move beyond the one-to-one counting towards more abstract methods of computation in the primary school. Another possible reason for poor learner performance, is that learners are promoted to the next grade, without having mastered the foundational concepts of the previous grade and ignoring such gaps in learners' foundational mathematics knowledge sets learners up for failure in later grades. These gaps in foundational knowledge, inhabit coherent development of number sense and teachers do not have the time to recap mathematical skills leaving learners behind (Graven, 2016). The consequence is then, that each class is in effect a "multi-grade" class filled with learners of different abilities and depth of foundational mathematical knowledge (Schollar, 2008, p. 8). These "multi-grade" classes are not only present in South Africa, but rather all over the world. Spaull & van der Berg (2020) reported that more than 50% of mathematical learning was lost in during the COVID-19 pandemic in the U.S. increasing the diversity of learning abilities in the classroom.

Spencer (2020) mentions that education can therefore no longer follow the "one-size-fits-all approach that has been in place for a couple of hundred years" (p.1). This is further supported by Priyadarshani and Jesuiya (2021) who mention, that in conventional classrooms students are often "spoon-fed" which leaves little room for in depth discovery of the subject content. The focus is on "cramming information" (Harari, 2018), which is flooding learners with irrelevant information instead of teaching them. Furthermore, learning in the conventional setting is seen as "reproducing what the teacher wants" (Higgs et al., 2010, p. 138) and the learner is simply the recipient of such information.

2.5 Strategies communicated by the Department of Education for managing COVID-19 education disruptions

At the outset of the pandemic, the Department of Basic Education (DBE) provided schools with a curriculum differentiation regarding curriculum trimming (or prioritisation) with the intended implementation date of the 1st of June 2020 (DBE, 2020d & Hoadley, 2020). This was communicated and summarised in a document called the Curriculum recovery plans (DBE, 2020c). In this document a trimmed version of the current CAPS curriculum was provided in an attempt to save the academic year of 2020. The purpose of the so-called curriculum recovery plans, that were incorporated into the annual teaching plans (ATP), was to reduce the content coverage to manageable core content including values, skills, knowledge, and attitudes while leaving enough room for meaningful learning (DBE, 2020c). For Grade 3 mathematics this meant several

changes in the 2020 ATP. Number sense was reduced from 1000 (CAPS, 2016) to 800 (DBE, 2020c). Within the realm of measurement, a significant shift occurred, with an emphasis on foundational concepts. This included a concentration on fundamental skills such as identifying currency notes and coins when working with money, as well as engaging with time and mass-related topics. Consequently, the curriculum in 2020 did not include the study of length, mass, and perimeter for Grade 3 learners.

These modifications in the 2020 ATP for Grade 3 mathematics had a substantial impact on the curriculum content, focusing on core skills and knowledge allowing ample room for meaningful teaching in the available time while excluding certain topics traditionally covered in the curriculum.

Further differences will be discussed in more detail in the document analysis in Chapter V. The decision on which 'trimmed' revised curriculum programme to follow, was given to the schools, depending on the amount of teaching time that was lost. This allowed for increasing the inequality gap in education again (Hoadley, 2020). Similar to previous interventions by the Department of Basic Education, as mentioned by Graven (2016), the system focused on checking what is taught and how it aligns with assessment standards, ignoring the unequal context in which the curriculum needed to be taught.

To understand how teachers managed the adjustment of the curriculum during and after the COVID-19 pandemic, it is important to clarify what curriculum management is. Bush & Bell (2002) define curriculum management as a cyclical process that includes four steps namely: planning, implementation, monitoring and evaluating and lastly review and audit. This is further supported by Yulieana (2020) who states that curriculum management requires teachers to plan lessons, organise suitable materials, implement the curriculum content, monitor learners progress and evaluate their own lessons. This is echoed by Gupta (2023) who states that teachers play a crucial role in bridging the curriculum with the students by translating it into meaningful learning experiences and fostering a positive and supportive learning environment.

In September 2020, the Department of Basic Education (DBE) stated that it would follow a 3 year "comprehensive catch-up plan […] to make up for lost teaching and learning time due to the lockdown" (Mokoena, 2020). As the loss in teaching time could have long-term effects such as "an increase in dropout when these [primary school learners] reach Grades 10-12" (Motsheka, 2021, p. 7). The DBE provided schools with a curriculum differentiation regarding curriculum

trimming - these were called the Curriculum Recovery Plans and served to accommodate the negative impact of COVID-19 on the education system over the course of three years from 2020 to 2023 building on the core concepts and increasing the content each year (Writer, 2020). Within these adjusted Annual Teaching Plans (ATPs) were distributed to educators giving them a weekly overview of the core curriculum content that needed to be covered (see Appendix 7). The decision on which of the suggested adapted curriculum programmes a school should follow, was given to the schools, depending on the amount of teaching time that was lost, increasing the inequality gap in education again (Hoadley, 2020). The purpose of the so-called "curriculum recovery plans" (DBE, 2020c, p. 1) was to reduce the content coverage to manageable core content including values, skills, knowledge, and attitudes while still aiming to leave enough room for meaningful learning. The content trimmed was done in alignment with the available teaching time during the COVID-19 pandemic. These ATPs were implemented from the 1st of June for Grade 7 and 12 and for all other Grades by the 9th of July 2020 (Hoadley, 2020).

Before providing schools with the Curriculum Recovery Plans, the DBE suggested the use of, as previously mentioned, TV programmes and radio stations to provide learners with some form of educational activity. Some of the Where possible, teachers were encouraged to make use of zero-rated websites and to share these with their learners as another form of educational activity. Some of these websites included the National Education Collaboration Trust (NECT) that provided teachers with online teaching resources such as the learners workbooks and the CAPS curriculum and later the adjusted ATPs (National Education Collaboration Trust, 2023). Another Website that was made available was Certificate in Online English Language Teaching (COELT). In collaboration with the British Council, the DBE made resources available to teachers that showed teachers, how to make use of WhatsApp as an online teaching tool and setting up video conferences on tools such as MS Teams, Google Meet and Zoom (British Council, 2021). However, as previously mentioned, these did not reach the majority of the intended audience because of the lack of internet access to majority of teachers and learners.

When schools were allowed to re-open but without learner attendance, some schools gave parents the option to pick up workbooks (Vale & Graven, 2023). Material was assigned to learners in an attempt make home learning opportunities available to learners. However, not all learners made use of such offering, making it difficult for teachers to provide equal treatment to all learners. According to StatsSA (2022) only 11.7% of schools offered remote learning options nationally with most schools opting for rotational options instead. The divide between urban and rural

schools was prominent, as twice as many learners had the option of continuing their learning with remote learning options in urban areas.

Once face-to-face teaching was made possible again, principals were instructed to find their own ways of adhering to the 50% capacity and social distancing rule (DBE, 2020f). The DBE provided different models for principals to make an informed decision when selecting a rotational model (DBE, 2020e). Some made use of weekly rotations, where each grade was allocated a specific grade. Others rotated learners on a 5-day – 3-week principle. Here each learner was allocated a group number and rotated within a 5-day cycle. To ensure that each learner had the same amount of teaching time, these rotations were done over a 3-week period. (National Education Collaboration Trust, 2023). Many schools followed these rotational plans until the 6th of February 2022 (Motshekga, 2022).

In summary, the COVID-19 pandemic has disrupted many aspects of education worldwide. The literature demonstrates that in countries like South Africa, the digital divide has widened, exacerbating inequality in the quality of education received by learners. Teachers are grappling with challenges in managing curriculum content coverage, as they are burdened with the task of keeping pace with the curriculum while accommodating learners who have missed significant portions of their foundational mathematics education. Despite efforts by the Department of Basic Education (DBE) to minimize non-contact lessons, the literature indicates that the majority of learners in South Africa did not participate in face-to-face lessons for nearly two years.

The literature review has provided a comprehensive understanding of the various perspectives, debates, and findings within the field of inquiry. Drawing upon this synthesis, the theoretical framework for this study is established. The chosen theoretical framework provides a lens through which to interpret and understand how teachers managed teaching mathematics during and post-pandemic. By grounding the research in a well-established theoretical foundation, the study aims to extend existing knowledge and offer new insights into the subject matter. This theoretical framework will guide the formulation of research questions, the design of the study, and the interpretation of findings, ensuring a rigorous and theoretically informed approach to the research endeavour.

CHAPTER III: THEORETICAL FRAMEWORK

3.1 Theoretical frameworks: Introduction

This section will discuss the frameworks used for the study and explain key components of these. The theoretical framework of a study forms the connection between the research question and all other aspects of the study (Grant & Osanloo, 2014). The study made use of two frameworks that cohere with each other, and both focus on the way in which new learning takes place. Firstly, the sociocultural theory of learning by Vygotsky (1978) that states that learning is social and dependant on the environment and interaction with other people. Secondly the use of a concerns-based adoption (CBA) model that unpacks how development and learning take place when a concern is introduced and unpacks how learners (in this case teachers) adapt to a new situation through adopting new methods or technologies is given. The latter was considered particularly useful given that the sudden COVID-19 pandemic necessitated speedy adaptation of teaching to new methods requiring increased technology use (even if only basic use of cell phones) to allow for continued teaching and learning at a distance.

Vygotsky's socio-cultural theory serves as the meta-theory informing the study while the concerns-based adoption model provides an analytic and theoretical frame tailored to teacher learning in relation a new learning and skills that are deemed important.

3.2 A socio-cultural perspective on learning

Vygotsky's sociocultural theory of learning assumes, that learning is socially and culturally mediated and that skills are acquired through dialogue and interaction with more knowledgeable members of society (Shah & Rashid, 2017). The theory describes the "zone of proximal development" (Vygotsky, 1978) which can be seen as the gap between current independent abilities and knowledge and our "potential development […] in collaboration with more capable peers" (p. 86). To learn one must be presented with tasks that are at the edge of our ability range and solve these problems in collaboration with peers. While the covid pandemic affected physically face-to-face teaching and learning opportunities learning still required mediation of learning opportunities and the provision of tasks and activities that could pull learners into their ZPD and build on their existing mathematical knowledge to actively construct new knowledge and to progress mathematically. This theory coheres with the concerns-based adoption model which understands that learning takes place in phases and in collaboration with peers.

3.3 Concerns-Based Adoption model (CBAM)

In this section I explain the concerns-based adoption model followed by a focus on the implementation of the model in the study. Herein the seven stages of concern that teachers may go through when being confronted with a new challenge or innovation will be explained. Thereafter, the model will be described and adapted to focusing on the implementation of curriculum change during the pandemic. Lastly, focus will be placed on the innovation configuration. This will provide a way of analysing the data that is collected in the study and provide ways to understand (and a language of description for) how teachers manages teaching during and post-pandemic. Focus will be placed on the levels in which teachers used these so-called new teaching innovations.

3.3.1 Concerns-based adoption model (CBAM)

The choice of the Concerns-based Adoption Model framework for this study is based on the idea that professional development takes place when support is given in the teaching process (Loucks-Horsley, 1996). Mugweni (2012) further explains that the Concerns-based Adoption Model (henceforth referred to as CBAM) supports the idea that teachers go through a process of change whenever they are confronted with an idea that is new to them. Loucks-Horsley (1996) assumes that when teachers are faced with innovative ideas for change or innovations, such as a change in the curriculum, they have questions that range from how these changes will affect them personally to finally asking if the change is working for the learners. This is supported by Hall (1974:4), who states that the institution that wants to implement change should be seen as a system of individuals who all have their own "concerns, problems, skills, agendas and needs." The concerns that teachers might have with innovative ideas being introduced need to be addressed and, depending on the level of support that is given during the process, teachers may choose to "ignore, resist, adopt and adapt [to] change" (Mugweni, 2012, p. 76).

The CBAM is mainly used by researchers to understand how teachers develop as they learn about curriculum changes and the implementation thereof. The teacher is seen as "the focal point in school curriculum change and implementation efforts" (Mugweni, 2012, p. 77). In this study, the stimulus for teacher change and learning was COVID-19 and thus managing learning at a distance and requiring increased use of technologies, the CBAM is used to identify the support of school management of the "change facilitator" (Mugweni, 2012, p. 82) offered to teachers in the implementation of moving teaching from face-to-face to distance teaching at the onset of COVID-19 and during the closure of schools. The CBAM identifies three major components that are

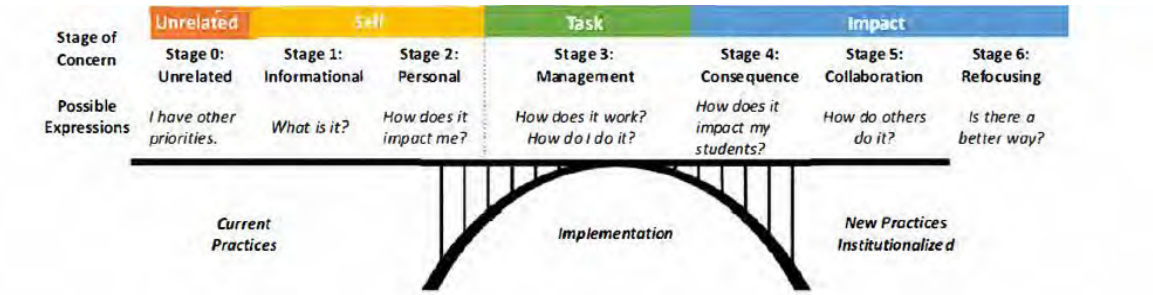
discussed in the following sections, namely: Stages of concern, Levels of use and Innovative configuration (Olson et al. 2020).

3.3.2 Stages of concern

Hall (1974) identifies seven stages of concern that summarise the experiences a teacher might have towards the implementation of an innovation. Olson et al. (2020), named the first stage as "stage 0" and can also be referred to as the stage of unawareness (Hall, 1974), In this stage teachers feel their work and conditions are unrelated to the innovation (or required innovation – in this case becoming distance education teachers) and take on an expression of no concern. In stage 1 teachers are aware of the innovation and they feel an urge to gather more information about the change that is being implemented. In this case, teachers might have felt an urge read up on ways in which they could reach their students whilst "direct contact" was not allowed. In stage 2, teachers begin to wonder how the change might affect them personally (Loucks-Horsley, 1996). Loucks-Horsley goes on to define the next stage (3) as a stage of exploration, in which the time that is required to understand the innovation or new way of reaching their students, is calculated. Stage 4 is one of consequence or limited impact, in which teachers realise that the change might have an impact on the learners and might start to question how the innovation can be adapted to better suit their learners. Here teachers might have tested various methods in which to contact their learners to continue teaching and now want to adjust their teaching to better reach learners. Next, a stage of collaboration is developed, and the teacher finds ways in which the innovation can be used together with other teachers' ideas. Lastly, Mugweni (2012) explains the final stage of refocusing, in which teachers share and develop ideas of their own to make the innovation even better. The stages are shown in Figure 1 along with possible teacher responses.

Figure 1

Stages of concern



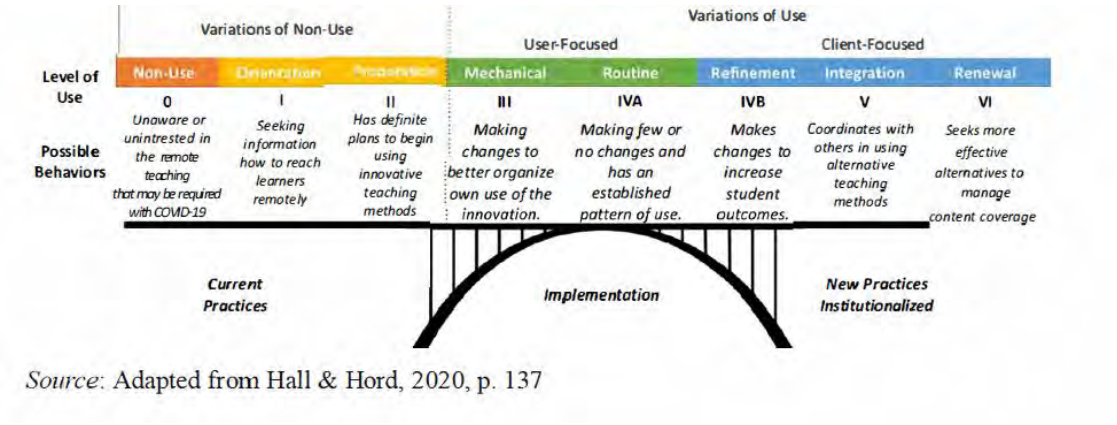
Source: Adapted from Hall & Hord, 2020, p. 107

In this study, the stages of concern provided a possible analytic frame for analysing how teachers may have experienced changes in the method of teaching and their views towards possibly having to continue to use such a method of instruction in the future. However, as will be seen in the data analysis (and in Figure 2), modifications and simplifications to this model were required in order for it to be useful for providing a lens for understanding the evolution of teacher responses and change in relation to their pandemic prompted learning. Thus, a contribution of the study is the way in which it speaks back to, adapts, and refines the model and the stages to suit the data emerging from the South African context.

3.3.3 Levels of use

This section focuses on the levels in which teachers begin to use and implement curriculum changes or innovations in their classroom. This includes teachers' changes in behaviour that can clearly be marked by seven decision points (Mugweni, 2012). These points will especially be important in understanding the impacts teachers' behaviour towards distance teaching had on the use and implementation of such a method of teaching. Figure 2 shows my adaptation of Hall & Hord's (2020) *levels of use* model to include possible behaviours linked to the 'levels of use' teaching adaptations and innovations required by COVID-19.

Figure 2
Levels of use



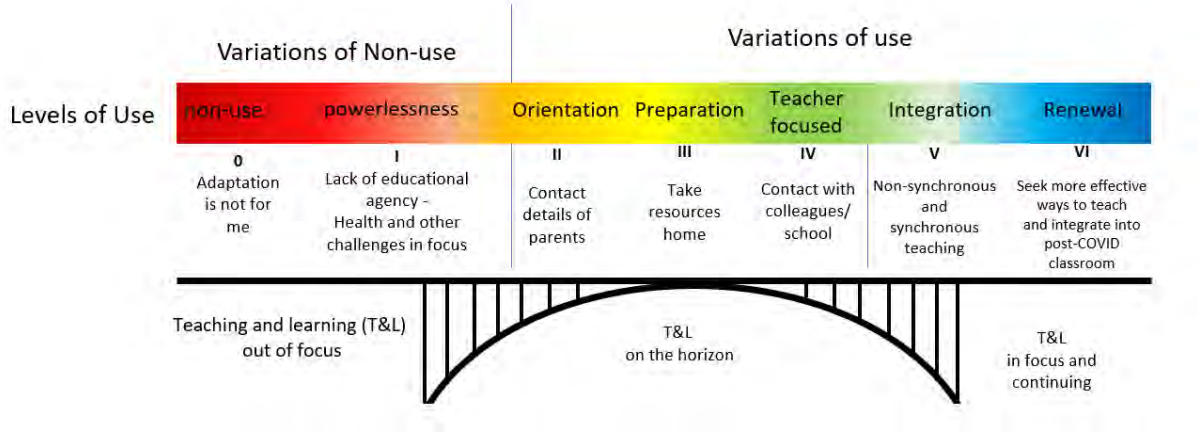
Source: Adapted from Hall & Hord, 2020, p. 137

The first level of use is described as "non-use" (Hall, 1974; Loucks-Horsley, 1996), where the teachers have no interest in acting on the innovation. In the next level (2), the teacher decides to become familiar with and learn more about the new development. During the "preparation" level (level 3), the user, or in this case the teacher, has plans to begin to use the new curriculum (Olson et al. 2020). In level 4, also referred to as the mechanical level, the teacher makes changes to the innovation to be able to better use it. Level 5 can be separated into two parts: firstly, routine and

secondly, refinement. Hall (1974) describes routine as the teacher making little or no changes to the innovation and establishing a pattern of use. Refinement on the other hand, is, when the teacher does make changes to increase the outcome of the innovation. The next level of use (level 6) is when the teacher deliberately tries to coordinate their use of the innovation with colleagues. Lastly, renewal (level 7), is seen as the teacher adjusting the innovation to be more effective. Mugweni (2012) describes the lower levels as being the teachers' day-to-day adaptations of an innovation, such as a new curriculum or for the purpose of this study, a new way of teaching at a distance. Mugweni goes on to say that the higher levels then describe a more meaningful interaction between the teacher and the subject area. Possible behaviours and levels of use are shown in Figure 2.

The levels of use were then further adapted within the South African context after rigorous analysis of the data (discussed in Chapter V and VI) as shown in Figure 3.

Figure 3
Levels of Use adapted to the South African context



Levels of use adapted to suit the South African context of remote teaching during the COVID-19 pandemic.

The first two levels of use (level 0 and 1) are described as 'variations of non-use' of distance learning during the pandemic. Level 0 'non-use' is described as the teacher who showed no interest in creating opportunities for learning. Such teachers assumed (or hoped) that the pandemic would not influence them or might be over after the initial 21 days of lockdown. In the next level, the teacher response to the pandemic was a sense of powerlessness, feeling overwhelmed, and a resulting lack of educational agency. They focused on health and safety needs rather than education needs. During levels 0 and level 1, teaching and learning (T&L) are out of focus as the focus is placed on the teacher's needs.

‘Variations of use’ describe the next five levels of use of the innovation of distance teaching. Within the next three levels teaching is not in focus yet, but teachers are aware that change to what teaching is like is inevitable. Focusing on teaching and learning are on the horizon. In level 2, also referred to as orientation, teachers took an active role in preparing for the unknown. Although unsure of what to expect, they ensured they had the correct contact details of the learners and parents in their class. This demonstrated their awareness that the pandemic might not be over as fast as the teachers in the first two levels.

During the “preparation” level (level 3), the teacher took home resources in case learning needed to take place in a different form. The teacher was unsure of what the future of teaching would look like but prepares for the unknown. Teachers also sent home learners workbooks when the initial 21-day lockdown was announced. In level 4, also referred to as the teacher focused level, the teacher made contact with the school, colleagues, or learners to plan for teaching to take place in some form or to gather information of what the future of teaching would look like.

The integration level (level 5) moves towards teachers making use of different teaching tools, either synchronous or non-synchronous. Teachers in this level of use integrated learning into the learners’ everyday life during the pandemic. The last level - ‘renewal’ can be understood as teachers who developed more effective ways of teaching during the pandemic and in the post-pandemic classroom. Some teachers made use of technologies by integrating them into the classroom or as a tool to communicate with parents when learners are absent from school.

3.3.4 Innovation Configurations

The innovation configuration “represents the pattern of use that results when different teachers implement change in their classroom” (Mugweni, 2012, p. 92). The use of the innovation configuration construct enables innovators the opportunity to ensure that the innovations are implemented according to the needs. Hall (1974) mentions that data that comes from whether the innovation configuration construct can be used to identify and address problems that arise with the implementation of innovations. Such problems can then be addressed and supported accordingly.

The innovation configuration was used in this study as a method of analysing ways in which teachers managed the use of technologies and remote learning as a new method of teaching and the support that was given by school management and the Department of Basic Education. Loucks-Horsley (1996) emphasise that “change is a process, not an event [and] that changes in classroom

practice can take anywhere from three to five years to be fully implemented" (p. 4). During the COVID-19 pandemic, teachers were given only a few days to move their teaching from in-person to digital learning. Change is always highly personal and involves dispositions and skills that need to be learnt (stages of concern - feelings and levels of use - skills). Without help along the way, acquiring a new method of teaching can become difficult or even impossible.

To better analyse occurring changes Loucks-Horsley (1996) and Olson et al. (2020) make use of the "bridge" (p. 6, p. 55). The bridge describes the sequence that is followed by people to implement innovations and to analyse the success of such innovations. The bridge model and metaphor focuses on the prerequisites that are needed for an innovation to 'cross over' from an idea to a successful reality. The lower stages of concern (awareness, information, and personal development) occur on the prerequisites or training side of the bridge (Loucks-Horsley, 1996). When the teachers begin to implement the innovation, they are standing on the bridge. The bridge is held up by the support and guidance of the implementors of the innovation, in the case of this study, school management. Without support, the innovation fails, or coping strategies are implemented that could result in poor implementation. With the necessary support, the innovation can be institutionalised (Olson et al. 2020).

Linking the CBAM with that of Vygotsky's social-cultural theory, we can see that Vygotsky's emphasis on social interaction aligns with CBAM's recognition of the importance of addressing individual concerns during the process of adopting a new innovation. Similar as to how Vygotsky highlights the role of interacting with more knowledgeable individuals in guiding learning, the CBAM recognises the significance of providing support and addressing concerns at various stages of adoption to allow for successful implementation of the innovation. Both frameworks emphasise the social and contextual aspects of learning and adoption, although from different angles.

In the next chapter I outline the research design and methodology. The chapter also includes details of the data analysis process as well as the research sample, significance and limitations of the study.

CHAPTER IV: RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

The research design provides the structure or framework for a study (Sileyew,2019). It involves the collection, analysis, and interpretation and analysis of data. The research design can be based on different models with each having a specific procedure associated with it. This study adopts an interpretative approach with the focus on understanding the way in which teachers managed the content coverage in Grade 3 mathematics in different quintile schools in the Tshwane area, Gauteng.

Having been personally affected by move to remote teaching, I directly experienced the impact of the COVID-19 pandemic on teaching. As such, the data that gathered for this study focused on the teachers' own experiences in moving during and post-pandemic from face-to-face teaching to distance teaching. Furthermore, I enquired about the teaching methods and strategies that teachers state they used to manage the mathematics content coverage - and which of these methods and strategies teachers carried through to their current teaching with the view to supporting content coverage.

The findings were analysed and interpreted as required by the interpretative approach within the theoretical framework of the Concerns Based Adoption model (Grant & Osanloo, 2014). This study made use of a qualitative approach. A variety of data collection methods were used to collect data to ensure that the study is valid and non-biased (Creswell, 2014). The qualitative approach was needed to understand how teachers managed the implementation of different teaching methods during the COVID-19 pandemic. Qualitative research aims to explain the participants' behaviour within their natural social setting (Lowhorn, 2007). Therefore, qualitative data gathering methods (discussed below) were used to understand the diverse ways in which teachers managed the shift to remote teaching with little preparation time.

4.2 Research Methodology

This study is framed within an interpretative paradigm and informed by the sociocultural theory that underpins the concerns-based adoption model. The study is focused on understanding the way in which teachers managed the content coverage in Grade 3 mathematics in different quintile schools in the Tshwane South Area.

The data collected for this study primarily centres on the first-hand experiences of teachers as they transitioned from in-person teaching to remote instruction, both during and after the pandemic. Additionally, the study explored the teaching methods and strategies teachers reported employing to effectively cover mathematics content. This examination allowed identification of the methods and strategies teachers integrated into their current teaching practices to support comprehensive content delivery.

A variety of data collection methods, informed by the qualitative approach, were used to collect data to ensure that the study is valid and non-biased (Creswell, 2014). The qualitative approach is essential in understanding how teachers managed the adoption of different teaching methods amid the challenges posed during the COVID-19 pandemic. Qualitative research seeks to provide insight into the participants' behaviour within their natural social setting (Lowhorn, 2007). Therefore, interviews and questionnaires were used to understand the diverse ways in which teachers managed the shift to remote teaching with little preparation time.

In the next section I unpack the specifics of the data gathering techniques of documentary analysis, questionnaires and interviews for my study.

4.3 Data gathering techniques

Different data gathering methods were used linked to different research questions. For RQ 1 the technique of document analysis was used. For RQ 2-5 data gathering methods included questionnaires and interviews.

4.3.1 Method of document analysis

As part of the research, a documentary analysis was conducted on education-related announcements made by the Department of Basic Education during the period from March 2020 to April 2022. This timeline was selected due to its significance in the context of the COVID-19 pandemic's impact on the education sector. Documents were selected based on specific criteria. These included timeframe and keywords. Documents within the timeframe of March 2020 to April 2022 were considered. Documents that included the terms "COVID-19 regulations," "guidelines," "ATP" (Annual Teaching Plans), and "curriculum" were included in the analysis. All selected documents meeting the established criteria were compiled into an Excel spreadsheet for systematic analysis (see Appendix 6). The documents were sorted according to the theme they related to and by date in the Excel spreadsheet. The identified themes included : information on the school calendar between 2019 and 2023; guidelines from the DBE regarding the health and safety during

the pandemic; assessment policies; ATPs for Grade 3 mathematics, and other guidelines. Documents in each theme were then sorted in order of date of publication. This compilation process ensured that all relevant information was centralized and organized for further examination.

A more comprehensive overview was then made of the Grade 3 mathematics Annual Teaching Plans between 2020 and 2023 (see Appendix 7). These plans were also added into an Excel spreadsheet and analysed according to the CAPS (2019) themes. This was done to get a better overview of any changes that had been made to the mathematic content coverage. In some cases, no data was available for a certain topic and the field was then colour coded in grey. Yellow colour coding was used for fields that seemed to be illogical and could not be explained with the help of other DBE resources such as DBE provided PowerPoint presentations (DBE, 2020g).

By conducting this documentary analysis, the study gained insights into the Department of Basic Education's responses and guidelines for educators during a critical period in the COVID-19 pandemic, particularly concerning its impact on the education sector. This method allowed for a comprehensive review of official announcements and their implications for educational practices and enabled answering Research Questions: What policy and documentation were provided to schools and teachers about teaching and curriculum coverage during the pandemic? How were teachers supported (if at all) by the DBE or schools to manage continued teaching and learning during the pandemic?

4.3.2 Questionnaires

Once participants indicated willingness to participate, they were given the choice of how to complete the questionnaire. Participants were given different options of how to complete the questionnaire with some opting to fill out the questionnaire electronically via Google Forms, others chose to fill out the forms on an editable PDF document and further participants chose to fill out printed copies of the questionnaires that had been distributed to them. The questionnaire consisted of 18 questions of which the last two invited participants to take part in an in-depth interview and share their contact information should they agree to the invitation.

All questionnaire responses were then added into an Excel spreadsheet for analysis (see Appendix 8). A thematic analysis was then conducted of the questionnaire responses and compiled into one document (See Chapter VI).

On the questionnaire form participants had the option to agree to participate in a more in-depth interview. Six participants accepted this invitation. This comprehensive data collection method allowed for flexibility in how participants engaged with the research, accommodating various preferences, and ensuring a diverse range of responses.

4.3.3 Interviews

Hobson & Townsend (2010) say that interviews are a versatile method of generating rich data which can be used to address a wide range of issues wherein humans can "tell you things about themselves" (p. 227). I made use of interviews to get an in-depth understanding of how teachers managed the mathematics content coverage in Grade 3 mathematics during the pandemic and in the post-pandemic classroom. Interviewees were given the option to respond in the language of their choice. As I speak English, German and Afrikaans teachers opted to have the interviews in one of these three languages. The interviews repeated many questions that had been addressed in the questionnaire to allow for richer verbal responses and to provide opportunity for teachers to elaborate on their written responses. The interviews were semi-structured (see Appendix 5) and allowed the participating teachers to discuss their experiences. The English interviews were transcribed using the Microsoft Word transcribe option. Interviews held in German and Afrikaans were transcribed by me. Participants were given the option to read through the transcribed documents for accuracy.

The interview responses were then thematically analysed and sorted with the questionnaire responses.

4.4 Data analysis

Data analysis was separated into two sections. First was the document analysis. Documents that have been released by the Department of Basic Education between March 2020 and May 2022 have been categorized into three main themes (Appendix 6). The first theme identified was the different school calendars that have been released. This was necessary to understand the management of mathematics content coverage in Grade 3. Next was general COVID-19 regulations that have been released around the re-opening of schools and the safety regulations around it. The last theme was the distribution of Annual Teaching Plans (ATPs). These have been analysed in detail and sorted according to the academic year (see Appendix 7). The ATPs haven been analysed in detail and will be discussed separately.

The second section of the data analysis was that of questionnaires and interviews. The questionnaire answers were entered into an excel spreadsheet (Appendix 8) and coded into teacher number (1-18) and then assigned a letter according to the school quintile the teachers work at (P-private, q5, q4, q3 – quintile 5-3). Each question was then analysed, and themes identified. Where relevant, two or three questions were combined, as the themes were similar. Interview participants were assigned a pseudonym and were used to confirm and strengthen questionnaire outcomes.

4.5 Research sample

Initially, gate keeper consent was obtained from the Rhodes University Ethics Committee (2023-7107-7523) and the Gauteng Department of Education. Subsequently, consent was obtained from the relevant schools. Participants were invited based on specific criteria, including the grade and subjects they teach. The focus was on teachers responsible for teaching mathematics in Grade 3 within the Tshwane South District. While I invited over one hundred teachers from 45 different schools from a range of quintiles to participate in my research my research participants are those 18 teachers who agreed to participate (and thus took the time to answer the provided initial questionnaire). Most of the teachers had more than 5 years of teaching experience however, a small group of participants with less experience were also included. Participants were provided with informed consent forms, outlining the research and their participation. These forms explained the research process, including the data collection methods. Teachers who completed the questionnaires were all invited to participate in interviews — six of the 18 teachers agreed to these interviews. Thus, the interview sample size is six.

4.6 Ethical considerations

Ethical guidelines have been put in place and include requesting gatekeeper permission from Rhodes University Ethics Committee (protocol number 2023-7107-7523.) (Appendix 1), the Department of Education, and the principals (Appendix 2) of every school that have been approached. Informed consent has been obtained from all participants within the research process, either on a signed form or on Google Forms (Appendix 3).

The participants were invited to participate on a voluntary basis. Before agreeing to participate in the study, time was set aside to ensure the research project was explained to teachers in detail and they were informed of their right to withdraw from the study at any point and that they would remain anonymous throughout the study. Anonymity was maintained. Teacher numbers along with the school quintile were used for questionnaire responses (e.g. T12 -Q4) and teacher names

additionally allocated to interviewees (e.g. Fatima, T17 -Q3/4) are pseudonyms). The outcome of the study would be made available to them upon request. Teachers' responses on the questionnaires have determined the questions that have been asked in the in-depth interviews.

4.7 Data validity

While validity is broadly defined as research that is conforming to acceptable principles or having a good quality (Cypress, 2017). In a qualitative study validity, according to Lincoln and Guba (1985) is understood to have four criteria including credibility, confirmability, dependability, and transferability. Maxwell (1992) further distinguishes between different types of validity in qualitative studies. He defines interpretive validity as the research having the ability to "catch the meaning, terms, interpretations, [and] intentions […] that participants have themselves" (p. 290) of the phenomenon being studied. The research should make use of terms that are used by considering the participants feelings, views, and viewpoints (Maxwell, 1992). I have ensured validity by considering the context, from which teachers share their experiences during and post-pandemic and by using the participants terms and meanings. As far as possible I have shared the verbatim words of teachers rather than to paraphrase my understanding of what they meant. This allows the reader direct access to the data and allowed them to judge the sensibility of the interpretations made in the analysis. Teachers were provided with transcripts of interviews for member checking.

4.8 Trustworthiness

The researcher acknowledges that data from interviews can be subjective. Sfard & Prusak (2005) explain that the audience can influence that way a story is told, shaping its content. While the researcher does not claim that the participants statements represent the objective truth, these narratives still provide valuable insight into their experiences of the way in which they managed teaching mathematics during and post-pandemic.

4.9 Significance of the study

There is limited evidence regarding the challenges posed to teachers regarding the content coverage in mathematics and a gap in the availability of data regarding how teachers are managing the content coverage in a post-pandemic environment. This study therefore aims to address this gap by exploring how teachers managed content coverage during the COVID-19 pandemic and in a post-pandemic environment. A focus was placed on Grade 3 mathematics, as this is the final

year in the foundation phase where foundational knowledge should be mastered. Limited data was available on the impact of COVID-19 on this age group.

4.10 Limitations

Some limitations were that only teachers in the Tshwane South area were included in the sample. The relatively small number of participants (18 teachers) with no teachers from quintile 1 and 2 schools is another limitation. Contacting quintile 1-3 schools was challenging, as their contact details were often incorrect. When visiting them directly, many principals gave their permission for the research but when approaching the Head of Departments and the teachers directly, they declined to take part in the research. Further limitations were that some teachers who participated in the questionnaires then opted to not take part in the in-depth interviews often due to time constraints. Another limitation was, that the Department of Education allowed the data collection time frame of April – October 2023. This left little time to contact schools, get their permission and connect with teachers. By the end of June many teachers were busy with assessments and reports and did not feel they had the time to participate. A few schools were willing to fill in the questionnaires over the June holidays but some. schools that only replied later stated that the time constraint with assessment by the end of September before the spring holidays prohibited their participation.

In conclusion the study took on an interpretive paradigm to understand the lived experience of how teachers managed the curriculum coverage in Grade 3 mathematics. To do this the study made use of a variety of data collection techniques that allowed for meaningful interaction with both content of the curriculum as well as understanding teachers perspectives on the topic. The study takes into account the limited data available that was gathered in the research sample. The data collected is, however, sufficient to adequately answer the research questions and draw conclusions. Although data from interviews and questionnaires might be subjective they still provide valuable insight into teachers perspective on teaching and managing the curriculum during and past COVID-19 pandemic.

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CHAPTER V: DATA PRESENTATION — DOCUMENT ANALYSIS AND DISCUSSION

5.1 Introduction

In this section I address the sub-questions the document analysis phase of the research and focus on sub-questions a and c as listed below.

What policy and documentation were provided to schools and teachers about teaching and curriculum coverage during the pandemic?

How were teachers supported (if at all) by the DBE or schools to manage continued teaching and learning during the pandemic?

To answer these questions all relevant documents were found on the official Department of Basic Education website, downloaded and thematically analysed. Three major themes were identified: school calendars, ATPs and general health and safety guidelines. Each theme was analysed separately as listed below.

5.2 Document analysis

In this documentary analysis I will first analyse the Annual Teaching Plans (ATPs) provided from the Department of Basic Education between 2020 and 2023. These were compared to the Grade 3 Mathematics CAPS (2019) document, which was seen as the curriculum standard.
I then analysed all further communication sent out by the DBE between March 2020 and April 2022 to gain insight into the guidelines that were provided to the teachers.

5.2.1 Insights from the school calendar

Before analysing the content of the ATPs, it is worth mentioning the number of school days that were provided in the planned curriculum. Here 2019 will be used as a 'guideline' to the expected number of school days (i.e. in the pre-pandemic year). All school calendars between 2019 and 2023 were used in this analysis as well as calendar information found in the published ATP documents and health and safety guidelines. The figures in brackets indicate the actual number of days vs the planned number of days. The footnotes provide links to the various documents from which this data is sourced. Table 1 shows a tabulated summary of school days provided by the DBE between 2019 and 2023.

Table 1

Number of school days between 2019 and 2023

	2019 Total 199 days[4]	2020 Planned total 158 (amended – max. 116 for gr. 3)[5]	2021 Total 198 days[6] (amended – 191 days)[7]	2022/23 – Total 199[8] days
Term 1 (in days)	48	46	50 (45)	47/51
Term 2 (in days)	51	35 (actual 5)[9]	50 (49)[10]	53[11] / 49[12]
Term 3 (in days)	53	35[13]	50 (49)	52/ 52
Term 4 (in days)	47	53	48	47/47

When looking at the number of school days it is evident that 2020 ATP was based on the assumption of having a total of 158 school days, however Grade 3 had at least 83 (119 in 2019 – 116 in 2020) days less than in other pre-pandemic school years. Even though 2021 also shows a reduction in school days compared to 2019 (12 days less) and 2022/2023 (8 days less), it was not as severe as in 2020. It is also noteworthy that the 2020 and 2021 school calendars were amended twice during the COVID-19 pandemic. The number of school days do not add up in the table as there is very different data available in different documents as listed in the footers. The number of school days shown on the ATP calendar does not take into account the phased return of grades to the school and the rotational school attendance of learners and are therefore not a true reflection

[4] DBE (2017)
[5] DBE (2020i)
[6] DBE (2020l)
[7] DBE (2021a)
[8] DBE (2022b)
[9] DBE (2020j)
[10] DBE (2021b)
[11] DBE (2022a)
[12] DBE (2022c)
[13] DBE (2020k)

of the number of school days learners attended school. The school days are shows as the maximum number of days available for learners in the classroom as many schools opted for different methods of learner attendance with many schools in quintiles 1-4 opting for rotation of learners on a bi-weekly basis as recommended by the DBE (2020e). This was confirmed in the interview with Fatima (pseudonym) (T17-Q3/4), as discussed in Chapter VI, who mentioned that "the contact time was too little. They come in for a day and if they missed a day in the week, they only saw us twice a week and if you are not there you missed out on the content […] and some did work and some did no work [at home]". Teacher 4 (T4 – P) further emphasised this point by stating that it "was a big problem [that] the children missed a lot of work, and it happened a lot […] [that they missed a day] and that child is very confused when he comes back because he missed a lot of work" and that some days teachers would only see "about 8-10 learners a day" out of a class of 40 learners. The shown school days can therefore only be seen as the maximum number of school days for learner attendance. Similarly, 2021, as learners full return to school was only resumed in February 2022.

5.2.2 Insights from the ATPs published by the DBE

Table 2 shows a tabulated summary of the content overview of the Grade 3 mathematics ATPs as provided by the DBE between 2020-2023 (see Appendix 7 for a full overview). Included is also the CAPS curriculum for reference. Each content area that was adjusted is discussed separately.

Table 2

Mathematics content as published by the DBE between 2019 and 2023.

Content	CAPS (2019)	2020	2021	2022	2023
Numbers, operations, and relationships	Up to 1000	Up to 800	Slowed but up to 1000	Slowed but up to 1000, inconsistencies in the terms	Up to 1000
Geometry	Positions, views, direction, 2D shapes, 3D objects	3D objects, 2D shapes (unexplained order change), symmetry,	3D objects, 2D shapes (unexplained order change), symmetry, views and position on informal map	2D shapes, symmetry, 3D objects	3D objects, 2D shapes, symmetry (unexplained order change), symmetry
Measurement	volume, time, length, perimeter, mass, area	Time, volume (both reduced)	Time, mass, length, perimeter, volume, area	time, volume	Time, length, mass, volume
Data	Collect, Represent, analyse: Table, tallies, label, graph (bar and pictograph)	Recognise data, represent, analyse (only 1-1): Tally, table, bar, pictograph	Only represent data	Collect and represent	Collect, represent, analyse: Table, tallies, label, graphs

When looking at numbers, operations, and relationships one sees that the number range for these operations was reduced from 1000 to 800. This was then reverted to 'normal' in the 2021 ATP. When taking a close look at the different terms of each year, there seem to be differences in the number range that is being worked in. In 2021 Term 1 introduced the number range to 200, and 2022 Term 1 introduced to 300 before 2023 reverted to introducing up to 500, making a slow return to 'normality' or to a pre-covid curriculum coverage. It appears there is the assumption that working to 800 is easier than to up to 999. And that reducing the number range in the first terms of the following years would make 'catching up lost teaching time' possible, however then compacting the remaining content into the last two terms. Working with fractions was removed

from Term 2 in 2020, only working with fractions in Term 3 and 4 by focusing on sharing leading to fractions. As the stated ATPs focus was on core skills and knowledge, one can assume that fractions do not form a part of the core skills that Grade 3 learners need to know.

Further looking at the different terms, the CAPS (2019) document suggest that Grade 3 learners should be able to recognise, identify and read number symbols from 1-1000 in Term 2 but should only be able to read and write number names from 0-250 even though they already wrote number names 0-500 in Term 1. Such unexplained errors are not only present in the CAPS document but are evident all through the ATPs 2020-2023. Another unexplained adjustment is shown in Term 2 of 2020, wherein learners should read number names from 1-250 but only write the number names from 1-200, assuming that learners are expected to write all number names from 1-250 and therefore reducing this number range would somehow 'win time' that was lost due to the pandemic as learners now need to write 50 number less. This trend is continued in Term 3 where number names are read to 500 but only written to 400. By making use of the term "to" or "up to" teachers are restricted in the number range that they introduce to the learners hindering optimal learning. This is confirmed by Westaway et al. (2023) who mention that this restriction in the number range reduces the learners' opportunities to see and understand patterns in the place value system by only introducing a new place value every year of schooling.

Next, I analyse adjustments to the content coverage of geometry. The CAPS document includes positions, views, directions, 2D shapes, 3D objects and symmetry into the broader geometry cluster (as is evident in the 2019 pre Covid column and the third row in Table 2 above). In the ATP for 2020 geometry was another key area that received curriculum trimming. Geometry was reduced to symmetry 3D objects and 2D shapes. It is noteworthy to mention, that 3D objects were introduced in term 3 and 2D shapes only in Term 4. It is unclear whether this was an intentional change or an error, because in 2019 ATPs and CAPS 2D shapes precede 3D objects) — the change, however, is unexplained and would not be matched by changes in the ordering of the workbooks. The 2021 ATPs then reintroduced views and positioning on maps but reduced these again (within the mathematics ATPs) in 2022 and 2023. It is evident that positions, views, and direction do not form part of the core knowledge and skills for Grade 3 mathematics as they have not been reintroduced to the mathematics curriculum. However, according to the DBE PowerPoint on the implementation of the 2020 revised curriculum (see Appendix 9), "the skill is not lost as [it] is also covered in Language and in Life Skills" (DBE, 2020g, slide number 13).

Measurement in the CAPS document is broken up into volume, time, length, perimeter, mass, and area. Learner should be able to convert between the different units of measurement and work with them in context. During the pandemic year pf 2020 the measurement was reduced to time and volume only. The argument here in the DBE PowerPoint was that length is taught in Grade 1, mass in Grade 2 and volume in Grade 3 and completely removing area and perimeter from the curriculum. However, the next years do not take this into account as the 2021 ATP reverted to the original CAPS content coverage of these measurements. Following this however, perhaps due to the realisation that teachers were not managing curriculum coverage in the time available the ATPs again removed all content other than time and volume. The 2023 ATP then saw a reintroduction of length and mass into the curriculum. No reason is given for the decision to exclude area and perimeter from the curriculum other than that it does not form part of the core skills learners need to master by the end of Grade 3. It is worth noting that most other content areas reverted to the original CAPS structure by the end of 2023, measurement is, however still being reduced to the core content.

Lastly looking at data handling as a core skill, the DBE states that no changes have been made to the content coverage in 2020 (see Figure 4). This however contradicts the content coverage suggested in the ATPs. The DBE encourages that daily register and weather charts are used as a way to engage with data. It is further recommended that data handling skills should "be infused in space and shape where sorting is done" (DBE 2020e, pg. 15). Learners should be able to collect and organise data about their class or school to answer specific questions using lists, tallies, and tables. This data should be represented in pictographs and bar graphs. This data should then be analysed and interpreted.

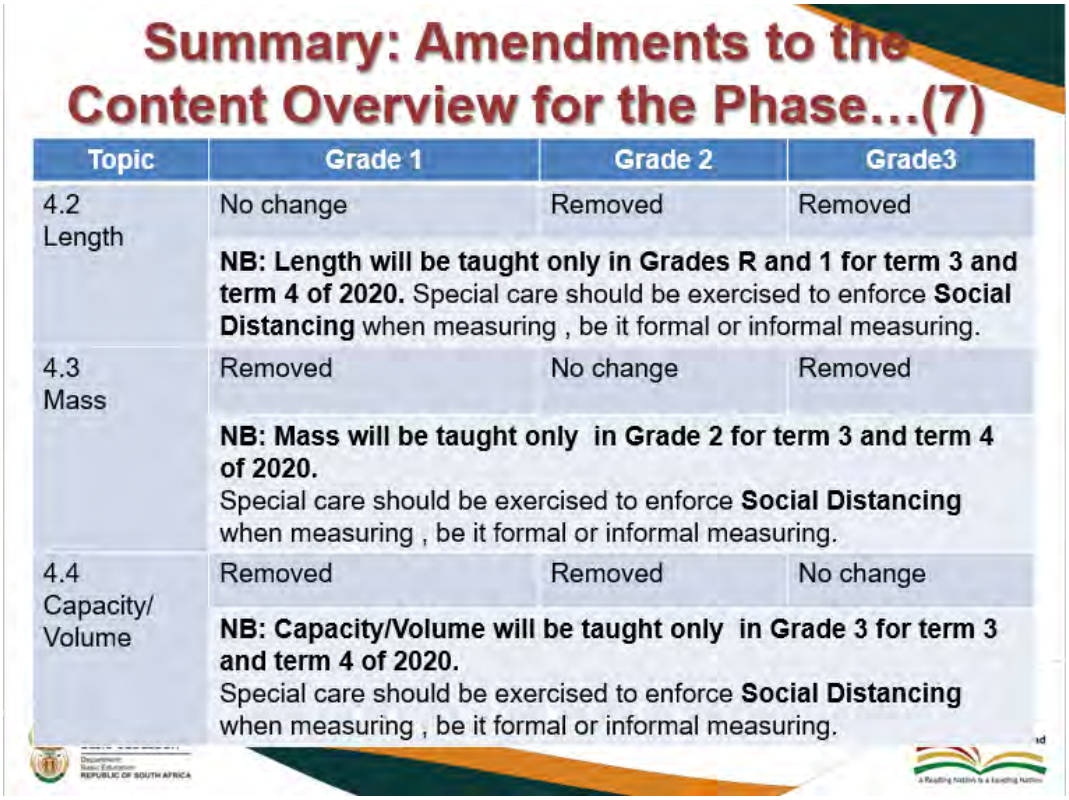
In 2020 this was reduced to learners being able to recognise data (no longer collecting their own data about the class or school), then representing the data and analysing it on a one-to-one basis. This means that one car for example is represented by a car in a pictograph. In 2021 content was reduced even more to learners only having to represent data and in 2022 having to collect and represent before returning to collecting, representing, and analysing data in 2023. It becomes clear that data representation remained a core skill in the curriculum progressively returning to the full curriculum coverage in 2023.

In the following Chapter VI, I analysed and discussed teacher experiences of the ATP changes. Of interest in relation to this Fatima (T17-Q3/4) mentioned in her interview that she was aware of the changes in the ATPs but ignored them stating: "I do what I think the learners should know […]

[because] it doesn't seem like they know what they want" (They referring to the DBE). This was echoed by Nafeesah (T15-Q3/4) who also mentioned that reducing the number range from 1000 to 800 did not make sense "because you teach the concept" and she never stopped teaching until 1000". This makes it clear that many teachers did not follow the ATPs provided by the DBE especially during 2020. Figure 4 shows an extract from the PowerPoint presentation circulated by the DBE to guide teachers in the use of the adjusted curriculum.

Figure 4

Extract from the DBE PowerPoint presentation on guidelines for teachers implementing the ATPs.



DBE (2020g)

While the focus here has been on Grade 3 – Appendix 9 shows the key ATP adjustments summaries for grades 1-3 – here we see that for Grade 1, 2 and 3 significant removals of content. See slide above that shows the 'removed' across E.g. for measurement Grade 1 did length only, Grade 2 did mass only while Grade 3 did volume only. Yet the 2021/2022 and 2023 do not seem to adjust specifically for these removals and seemingly assume the 'removed' content in Grades 1 and 2 will simply be caught up in Grade 3 even while the learners will not have had exposure to foundational concepts that build towards the content coverage in the progressive grades.

5.2.3 General guidelines published by the DBE

During the pandemic the DBE released a variety of documents containing important information regarding the reopening of schools and safety of staff and student at the school during the COVID-19 pandemic. Documents have been chosen based on their relevant to the studies topic and sorted into four categories naming: school calendar adjustments, COVID-19 regulations and hygiene guidelines, mathematics curriculum coverage (ATP), and other such as life skills curriculum and changes in assessment requirements.

It is noteworthy to mention that under all the documents found on the DBE website, there was only one link that showed the TV channels and radio schedule and even here there was no mention of any TV or radio programmes suitable for Grade 3 mathematics. As mentioned in the literature review in Chapter II, the focus of the available TV programmes was on Grade 10-12.

To conclude, the DBE provided a large number of documents during the pandemic in an effort to assist schools and more specifically teachers and learners to keep learning loss to a minimum. On paper the DBE seemed to provide the teachers with enough information to make use of and manage the adjusted curriculum. It becomes evident, however, that these documents somewhat contradicted each other and seemed to cause more confusion and frustration amongst teachers as will be discussed in the next chapter.

CHAPTER VI: DATA PRESENTATION TEACHER QUESTIONNAIRES AND INTERVIEWS

The collected data will be presented visually with the use of tables. The data in these tables will then be explained before being analysed in Chapter 7. To answer the posed research questions, the research made use of questionnaires and interviews containing open-ended questions, keeping in line with the criteria of qualitative data collection methods. As sub-questions b, d, and e focused on the way in which teachers managed the mathematics curriculum, interviews and questionnaires were used to gain insight into the teachers' current situation.

The questionnaire and interview analysis addressed the sub-questions b, d and e:

> b. How did teachers manage mathematics content coverage during the pandemic?
>
> d. How are teachers managing mathematics content coverage currently? And What pandemic emergent strategies are teachers continuing to use in their current practice?
>
> e. What role did/does technology play in b, c, and d?

6.1 Insights from Questionnaires

The questionnaire responses offered valuable insights into teachers' experiences of teaching Grade 3 mathematics during and after the pandemic. The findings also point to additional challenges posed by the pandemic that teachers faced, along with an examination of the support they received from both the Department of Basic Education (DBE) and school management.

6.1.1 Analysis of questionnaire data

In order to connect responses to particular teachers from various quintiles each of the 18 teachers was allocated a number T1-T18. Table 3 below shows the distribiution of the 18 teachers responses across different types of schools.

Table 3

Teacher participants across different quintiles [14]

School type	Number of participants from each school
Private school (P)	5 from 3 schools (T1-T5)
Quintile 5 (Q5)	6 from 2 schools (T6- T11)
Quintile 4 (Q4)	3 teachers from 1 school (T12-T14)
Quintile 3/4[15] (Q3/4)	4 from 2 schools (T15 – T18)

All participants were female which is not surprising given that the majoirty of Foundation Phase teachers are women.

All teacher questionnaire responses were transcribed to enable analysis. In the reporting of the analysis of the data we share teacher codes to indicate the teacher who generated the data along withthe quintile of the school they teach in. Thus for example T3-P indicates the third teacher in the data set from a private school while T12-Q4 indicates the 12th teacher in the data set from a Quintile 4 school. Each questionnaire responses (see Appendix 8) has been coded in this way.

Five teachers voluntarily additionally participated in face to face interviews. These were T1, T2 and T3 from a private school and T15 and T17 from a Q3/4 school. These teachers were given the pseudonymns Lesedi, Elena, Katarina, Nafeesah and Fatima respectively. The pseudonymns support the reader to link the data of each teacher across various sections more easily than simply using the numbers that have been used on the questionnaire data that includes 18 teachers.

Recall from the methodology section that the questionnaire included 16 questions. Responses to all sixteen questions were thematically analysed. The analysis below focuses on teacher responses to each question with some questions grouped together when they provided similar information.

[14] Data bank has detailed information on school quintiles.

[15] For two schools there was some discrepancy between the teacher stated quintile (or that on the school's website) and that of the DBE website. We thus refer to the quintiles for these schools as Q3/4.

Similarly the interviews of the five teachers were analysed per question, however in the reporting of this data I have integrated this data with the questionnaire data in order to provide a richer picture of the emergent themes. The interview responses were coded in correspondance with teacher questionnaire codes. For example teacher T1-P was coded as T1-P-I where the added I indicates that the quote is from her interview response and not her written questionnaire response..This is provided for all interview responses to all questions other than the final question which did not directly link with the questionnaire questions. This question asked for feedback to policy makers and I thus report on this separately.

The questionnaire was aimed at gathering data towards developing understanding of how teachers managed to cover the Grade 3 mathematics curriculum during the COVID-19 pandemic and how they are currently managing to cover the content in a post-pandemic classroom setting. It was important to understand the role that technology played in managing the curriculum content. Schools from different quintiles were approached to have a comprehensive overview of how teachers in different school settings managed to cover the curriculum. It was also important to understand in what way teachers were assisted in this sudden move to distance learning.

Summary and analysis of teacher responses to how they prepared themselves for the closure of schools (Question 1)

Analysis of all 18 teacher responses highlighted three themes related to preparation for school closures. Namely that teachers either: actively planned for distance teaching, gathered resources for an unknown future or did not take action (considered a more passive approach with some indicating experiencing powerlessness or a lack of agency in relation to the fear of the pandemic and the unknown future. Table 4 shows the distribution of the 18 teachers' responses across the three different response categories to school closures.

Table 4

Three different ways in which teachers responded to the closure of schools.

Active planning for distance teaching	Gathered resources for the unknown future	Passive response – lack of agency
7 teachers T5-P, T6-Q5, T7-Q5, T8-Q5, T9-Q5, T12-Q4, T14-Q4,	5 teachers T2-P, T4-P, T10-Q5, T11-Q5, T16-Q3/4,	6 teachers T1-P, T3-P, T13-Q4, T15-Q3/4, T17-Q3/4, T18-Q3/4

Table 4 shows that seven teachers indicated that they actively planned to continue teaching either online or via other methods and began these plans at the point of school closures. For example, T9-Q5 wrote about how they planned for online teaching "We prepared by turning everything digital. For example, MS Teams and videographer to help capture lessons and send it out via MS Teams and PowerPoint." On the other hand, T12-Q4 wrote about planning for distance teaching other methods "We made booklets, readers".

Five teachers wrote that they took resources (e.g. physical resources, parent numbers and learner data) home without knowing what they were planning on doing. T2-P mentioned "I collected all of the school-given materials and took them home for the duration of the closure. Specifically, books, work sheets and teacher handbooks."

Elena elaborated in her interview:

> "I remember that I definitely took the textbooks home. All of them and not just two notebooks or something, but I took them all home and also extra material to copy. I also took things like that with me. Yes, but I hadn't given the children anything. Because. But for us, the holidays were right then. We used to just go on holiday and that made it an official break. And then you didn't give the children anything anyway." (Elena (T2-P), Int-Line 6).

Six teachers however indicated that the pandemic was 'too sudden' or 'unexpected' and they therefore did not plan any work. In this respect they took a more passive approach to managing their work during the pandemic and indicated a lack of agency. For example, two of the six teachers (T15-Q3/4 and T17-Q3/4) reported that their principles had shared information in the form of 'official circulars' about the school closures with them but did not indicate any planning for managing distance teaching. In her questionnaire response T3-P said: "my main concern was the learners and how far we will be behind the scheduled curriculum." She elaborated on this in her interview:

> "In the beginning, I didn't really think a lot about it, but once it [COVID-19 Lockdown level 5] started to extend a little bit more, obviously we were worried about not only our jobs, but also how the kids will be impacted, and we also know that it's going to be impacting them from then forward. So [I was] quite stressed, but we didn't know what to expect." (Katarina (T3-P) Int-Line 4)

Similarly in the other interviews Nafeesah reported that she did not send work home with her learners as for most schools it was "end of term and we don't take any work home for the holidays" (Nafeesah (T15-Q3), line 6). This was also confirmed by Katarina and Elena. Elena for example explained: "I hadn't given the children anything because for us, the holidays were right then" (Elena (T2-P) Int- line 6).

However, Lesedi mentioned that she told her learners to take home their books and said for the initial 21 days "the focus goes in maths and English" (Lesedi (T1-P) Int-line 6).

Considering these responses against the CBAM model teachers responses align with Level 0 with the level of use 'non-use' in terms of adapting to distance education. That is, they either had a passive response, did not take any work home with them and/or were scared for their well-being. Some, although passive, stated concern for the well-being of their students and how it might impact them. This aligns with Level 1 of the CBAM. Teachers showed a lack of educational agency and feelings of powerlessness. In the next section some teachers planned for the unknown. A teacher reported that she made sure she had the correct contact details of the parents in her class in-case she needed to make contact with them. This response aligns with teachers orientating themselves within the unknown as seen in Level 2 of the CBAM. Other teachers either packed in their books or took other resources home with them while some more sent books home with the learners. These teachers prepared for distance teaching to take place I some form aligning with

Level 3 of the levels of use. In the last phase of the responses, teachers took an active role in ensuring no teaching time is lost. They prepared for online lessons -either synchronous or non-synchronous, by putting together work packages or creating MS-Teams profile for the learners. This response can be seen in Level 5 of the CBAM, where teaching and learning is put in focus and continuing either non-synchronous or synchronous.

Summary and analysis of teacher responses to how teachers were instructed to continue teaching during COVID-19 (Question 2)

Analysis of all 18 teacher responses showed that teachers made use of three main ways of continuing teaching during the COVID-19 pandemic. Participants made use of online teaching (synchronous), asynchronous teaching and two received other instructions on the continuation of teaching during the pandemic, such as "maintain distance and wearing masks" (T16-Q3/4). Table 5 shows the distribution of the 18 teachers' responses across the three different response categories to Question 2 about how teachers continued teaching during COVID-19.

Table 5

Three ways how teachers continued teaching during COVID-19

Online (via MS Teams/ video)	WhatsApp	other
11 teachers T1-P, T2-P, T3-P, T4-P, T5-P, T6-Q5, T7-Q5, T8-Q5, T9-Q5, T10-Q5, T11-Q5,	5 teachers T12-Q4, T13-Q4, T14-Q4, T17-Q3/4, T18-Q3/4	2 teachers T15-Q3/4, T16-Q3/4

Eleven teachers were instructed to continue teaching using synchronous methods. Synchronous video conference methods are live video tools such as Zoom or Microsoft Teams (Vale & Graven, 2022). It appears that only teachers in private and quintile 5 schools had the necessary resources to be able to do synchronous teaching. A teacher from a well-resourced private school explained:

> "[The ways of teaching] changed over the course of lockdown. First it was weekly work plans/ learning packages. Then online classes via Teams were added. These online classes could also be weekly for each learning group / class. At the end it was supposed to be a

> combination between online classes, online course work (via Teams) as well as paper-based learning packages. (T2-P).

This response aligns with Level 5 of the levels of use in the CBAM. Teachers integrated synchronous and non-synchronous teaching into the everyday life of learners. As T2-P explained, teaching changed over the course of the pandemic showing a move into Level 6 of the CBAM, where teachers try to find more effective ways of teaching both during and past-pandemic.

Five teachers, from a range of quintiles, made use of asynchronous video tools such as WhatsApp or Facebook. This also included teachers that handed out workbooks to learners and gave instructions to learners via WhatsApp. T17-Q3/4 explained the instructions that she received as follows: “Walk in walk out- fetching worksheets booklets and online activities.”

Lastly a teacher (T16-Q3) was instructed to “maintain distance and wear [a] mask” and a further teacher relied on the school to take over responsibility for parent communication: “The principal established a group and communicated in the group. Parents must fetch learners’ booklets and online activities” (T15-Q3/4). This teachers’ initial response to the pandemic falls into Level 1 of the levels of use. She showed a lack of educational agency and teaching and learning was out of focus.

Summary and analysis of teacher responses to what guidelines they received from the DBE and the schools (Question 3)

When asked what guidelines teachers were given to teach mathematics four themes were identified from the 18 teacher responses. Teachers made use of ATPs, presentations or videos, other guidelines or received no guidelines from either the DBE or their school. Table 6 shows the distribution of the 18 teachers’ responses across four different response categories to Question 3 about DBE guidelines received.

Table 6

Guidelines teachers received from DBE or their school in continuing mathematics teaching.

ATP	Presentations/ videos	other	No guidelines
2 teachers	6 teachers	3 teachers	7 teachers
T12-Q4, T15-Q3/4	T6-Q5, T7-5, T8-Q5, T9-Q5, T10-Q5, T3-P	T16-Q3/4, T17-Q3/4, T18-Q3/4,	T1-P, T2-P, T4-P, T5-P, T11-Q5, T13-Q4, T14-Q4

It becomes evident from this question that many teachers across the quintiles received no guidelines on how to continue teaching. For example, T4-P mentioned: "No guidelines were given. I took my own initiative and made videos where I explained the different concepts for the learners." On the other hand, T11-Q5 explained that she was unaware of any guidelines from either the school or the DBE. Interestingly a majority of teachers in private schools received no guidelines on how to continue teaching even while these independent schools belong to independent school bodies.

Teachers in Quintile 5 stated that they were mostly instructed to create videos or PowerPoint presentations. For example, T6-Q5 explained the use of "PowerPoint presentations, online videos using a visualiser and with the use of CAPS and ATPs". Similarly, T9-Q5 wrote: "We used mathematical concepts but simplified them on a PowerPoint then used our previous teaching experience to teach it online."

The majority of teachers in quintiles 3/4 seemingly received other guidelines. For example, T16-Q3/4 noted: "To give enough time to learners and not expect them to do as they were before." On the other hand, T17-Q3/4 said that she attended a virtual workshop on how the ATPs should be used and on problem solving.

Fatima mentioned when asked about the guidelines she received from the DBE to teach mathematics in her interview:

> "They had to come up with ways on how they would be able to catch up on the work that was done. And I think that is where the problem comes in. I don't come up to you and say 'look here is a child. How far did this child get with the work. […] But I think the

> Department abandoned us by not giving clear guidelines on how to catch up the backlog or set up a separate something. [All the DBE did] was give us a watered-down version of a thing." (Fatima (T17-Q3) Int-line 16-18).

A similar response was reported by Nafeesah (Int-line 89) that although the ATPs were given by the DBE, the learners books did not change, and she therefore rather followed the learner books than the ATPs. Katarina on the other hand mentioned: "We were guided well, but also a lot of pressure to do things in a certain way but we were kind of told what to do because [instructions] comes from the head office." (T3-P, Int-line 18). Although T1-P mentioned in her questionnaire response that they were not given any guidelines she mentioned in her interview that "the school emailed the educators with regards to the updates on what is happening and when schools would open up and they emailed the students with the same information" (Lesedi (T1-P), Int-line 10). This was similar for T2-P. In the questionnaire response she mentioned "No guidelines in particular were given. However, we got suggestions for online content such as learning videos and apps. Especially the learning App Anton played a significant supporting role". In her interview she, however mentioned that

> "At the very beginning [the instructions] were very vague. As far as I remember it was just that we should have something for each subject and give work assignments that there is something to do for each subject at home. And later, they added how much working time should be spent on each subject." (Elena (T2-P), Int-line 14).

Fatima on the other hand said that the DBE "rather wanted to catch up on the backlog that was created but it was actually the initiative of the teachers. They had to come up with ways on how they would be able to catch up on the work that was done. And I think that's where the problems come in." (Fatima (T17-Q3), Int-line 16).

T3-P painted a different picture on the support she received by stating:

> "We were given training from the curriculum head on how to record the lessons and how to upload but we had to use our normal classroom routine to create video lessons. We had to make use of tangible items, pictures, and then abstract methods. This was more challenging as the tangible items weren't tangible over a screen. Later we started teaching live. We still had to use the normal classroom routine. We did have to create a Google Forms after every lesson, to check if the learners understood the concept/skill taught."

T16-Q3 reported different advice. She stated that she was instructed "to give enough time to learners and not expect them to do as they were before."

Summary and analysis of teacher responses to what contact teachers had with the school, parents and learners during the pandemic (questions 4,5 and 6).

Questions 4, 5 and 6 are combined for analysis as the questions are connected and the responses were similar across these questions. These questions focused on the communication that teachers used with their school, learners, and parents. Two key themes that were identified: use of synchronous and use of asynchronous communication tools. Table 7 shows the distribution of all 18 teachers' responses to questions 4,5 and 6 within the two themes that have been identified.

Table 7

Contact teachers had with school, parents and students

Synchronous	Nonsynchronous
11 teachers	7 teachers
T1-P, T2-P, T3-P, T4-P, T5-P, T6-Q5, T7-Q5, T8-Q5, T9-Q5, T10-Q5, T11-Q5	T12-Q4, T13-Q4, T14-Q4, T15-Q3/4, T16-Q3/4, T17-Q3/4, T18-Q3/4

Teachers in the private and quintile 5 sector seemingly had access to digital resources that enabled them to make use of synchronous teaching methods. Even if not all learners had access to these resources, Katarina reported that they allowed parents to come and use their internet access at the school to be able to access digital resources (T3-P), Int-line 28). Lesedi explained:

> "So the school emailed the educators with regards to the updates on what is happening and when schools would open up […] school management at some point [had a meeting] on how they wanted us to implement and restructuring of the curriculum would be […] and how we would make sure that the students get onto the MS Teams platform" (Lesedi (T1-P), Int-line 10 &12).

Later in her interview she mentioned another important aspect of online learning:

> "In the beginning, I think for some it was a challenge and then it became something that they could look forward to seeing that they couldn't leave their houses and they started looking forward to the times that we would meet online. But then filtering towards the end it became potent. IT became monotonous and they were actually not coping with being online anymore" Lesedi (T1-P) Int-line 25).

Teachers in quintiles 3 and 4 had significantly different experiences of contacting parents, school and learners linked to the differences in availability of technology available to learners and their families. For example, T13-Q4 mentioned: "We had a WhatsApp group for office admin, for the learners and educators. We created groups for group 1 and group 2 on alternate days (2 cycles)." On the other hand, T17-Q3/4 explained that work packs were created for learners and "appointments with parents to collect on certain days." Nafeesah explained that "we relied a lot on the parents for [learning taking place at home] because we were not as privileged to be able to do online teaching" (T15-Q3/4- I, Int-line 26). She further explained her experience of making use of WhatsApp as follows: "We had the parents' numbers on the WhatsApp groups and the parents were in contact with the teachers that way. But many teachers said that the parents kept phoning and bothering them" (T15-Q3/4), Int-line 105).

Although the communication with parents via WhatsApp was important, parents now had the teachers' personal numbers and Fatima explained: "some parents really did ask for the work and the homework so that their children can do the work and they can help their children" (Fatima (T17-Q3/4), Int-line 46) while others miss-used the platform outside of teaching hours.

These responses showed that as the pandemic progressed teachers started to make contact with the school, colleagues and parents as shown in Level 4 of the levels of use. Initial contact then turned into platforms of either synchronous or non-synchronous teaching as seen in Level 5.

Summary and analysis of teacher responses to what communication tools they still made use of past pandemic (Question 7)

Question 7 sought to understand what communication tools teachers still made use of past COVID-19 that they used during the pandemic. Two main responses were identified: yes – still making use of communication tools and no- not making use of communication tools. The first section was separated into two sub-categories being: WhatsApp and Synchronous communication

tools. Table 8 shows the distribution of the 18 teachers' responses across different responses with two sub-categories to Question 7 about communication tools that teachers still use post-pandemic.

Table 8

Teachers still making use of communication tools post COVID-19

Yes		No
WhatsApp	Synchronous tools	
10 teachers	4 teachers	4 teachers
T4-P, T6-Q5, T10-Q5, T11-Q5, T12-Q4, T13-Q4, T14-Q4, T15-Q3/4, T16-Q3/4, T17-Q-3/4,	T1-P, T7-Q5, T8-Q5, T9-Q5	T2-P, T3-P, T5-P, T18-Q3/4

Most teachers reported that they do still make use of WhatsApp as a communication tool with parents. T4-P explained her use of WhatsApp as follows: "We still use WhatsApp for main communication with parents if learners are absent and they need to inform teachers." T15-Q3/4 mentioned that she still made use of WhatsApp groups as a communication tool with the school.

Some teachers mentioned that they still make use of synchronous platforms such as MS Teams. Those teachers that reported that they are still making use of MS Teams mentioned, that they used it "if learners are absent, they can continue with work" (T7-Q5) or "to do quiz activities with the learners" (T1-P). Elena elaborated in her interview:

> "I still used teams to make the work available to sick children who were ill at home or to upload all the content before a class assignment. Communication with parents also still took place via this system. In some cases, parents were guided through it" (Elena (T2-P), Int-line 38).

Only four teachers reported that they no longer make use of any communication tools that they used during the pandemic to communicate with parents. For example, T2-P explained: "No, at this point I don't use them anymore. But post-pandemic while I was still at my old school, I did use MS Teams from time to time to send out missed work and to support students at home." Synchronous methods of communication were phased out rather than just stopped abruptly to allow a smoother transition from distance teaching back to in person teaching.

Summary and analysis of teacher responses what guidance they received from the DBE or their school on the management of the mathematics curriculum coverage (Question 8).

Question 8 considered the teachers experiences for the guidance they received from either the DBE or their school in terms of managing the mathematics curriculum during the pandemic. Three themes have been identified: no guidance, guidance from the DBE and guidance from the school. Table 9 shows the distribution of the 18 teachers' responses across three different response categories to Question 8 about DBE and school specific guidelines teachers received to manage the stipulated mathematics curriculum coverage.

Table 9

Guidance received from DBE or school

None	DBE	School
4 teachers	11 teachers	3 teachers
T3-P, T4-P, T5-P, T11-Q5, T13-Q5,	T1-P, T6-Q5, T7-Q5, T8-Q5, T9-Q5,T10-Q5, T12-Q4, T14-Q4, T15-Q3/4, T17-Q3/4, T18-Q3/4	T2 -P, T16-Q3/4

It becomes clear that majority of teachers received support from the DBE who sent out adjusted teaching plans (ATPs). T6-Q5 explained the guidance as "adjusted ATPs was provided from the Department of Education regarding mathematics and other subjects." This support was also reported by T15-Q3/4. T18-Q3/4 said she received the following detailed advice and support: "Annual Teaching Plans were amended. Learners attended [lessons on school premises] in groups to maintain social distancing. All COVID-19 protocols were adhered [to]. The department of basic education hired education assistants and general assistants to various schools to assist teachers with sanitizing learners and help to maintain social distances." Two teachers, T12-Q4 and T14-Q4 mentioned that they attended virtual workshops hosted by the Gauteng Department of Education on a district level. T2-P mentioned the support and guidance she received as follows: "[no support] from the Department of Education. From our school's side we were told that we do not need to worry about covering the full curriculum. But rather focus on the most important content." Given that this teacher is at a private school the absence of direct communication from

the DBE is possibly expected though one might have expected some communication from the independent schools' body.

Of the five teachers that reported not receiving support from the DBE or their school, two mentioned that they did however receive support from their colleagues. One of which was T4-P, she explained: "No guidance was given from the Department of Education. Teachers guided each other and helped where they could, as everything was still new to everyone." A similar response was given from T5-P, who took matters into her own hand and helped her colleagues as she was most experienced in online teaching. T3-P was unsure of any support given from the DBE directly but mentioned "[…] we might have used their updated catchup curriculum to structure our curriculums a bit." In her in-depth interview Katarina then explained that the school she taught at made use of the Prime curriculum from Singapore were mathematics and English were adapted slightly by the school leaders to accommodate remote teaching (T3-P, Int-line 24).

Although most teachers reported receiving support from the DBE Fatima mentioned in her interview that she would have liked more support and felt "the Department abandoned us by not giving clear guidelines on how to catch up the backlog" (T17-Q3/4), Int-line 18).

Summary and analysis of teacher responses what additional support they required from the DBE or their school (Question 9)

Analysis of all 18 teacher responses showed that two-thirds of teachers required additional support. Here five themes were identified. Teachers either required no additional support or support in four different ways: professional development, data, resources or hardware. Table 10 shows the distribution of the 18 teachers' responses across five different response categories to Question 9 about additional support teachers required from the DBE and their schools.

Table 10

Additional support teachers would require from the DBE and school

None	Professional development	Data	Resources	Hardware
6 teachers T4-P, T8-Q5, T9-Q5, T10-Q5, T12-Q4, T14-Q5	4 teachers T1-P, T3-P, T11-Q5, T15-Q3/4,	2 teachers T2-P, T5-P	4 teachers T6-Q5, T7-Q5, T13-Q4, T16-Q3/4	2 teachers T17-Q3/4, T18-Q3/4

A third of the participants mentioned that they required no further support from the DBE during the pandemic. Another five teachers had similar feelings as T4-P explained in her response: “There is no additional support that the Department of Education could give me.”

T2-P required “compensation for extra data costs. Maybe during the course of the pandemic an updated, official curriculum.” Another teacher said, “I managed very well on my own however, I know most teachers would have enjoyed some help in means of data as not everyone had access to the internet” (T5-P). Many teachers would also have liked access to “example resources of activities (worksheets, assessments)” (T6-Q5). T3-QP mentioned that she would have liked “to slow down and adjust the plan completely - to actually come and see what is happening in schools - to be in the field” (T3-P). Those teachers that were required to teach online mentioned that they would have like to be given the skills to effectively teach online. T11-Q5 would have liked the school/DBE to be “equipping teachers with skills to make good PowerPoint presentations so it is easy for learners to use it, giving teachers something that can help them focus on the most important facts (all the facts in one book, something like that).”

Lesedi explained that she would have liked more support in the use of technology not just during COVID-19 but in general.

> “I think that [the DBE] can definitely help by bettering the IT equipment that is at school, giving teachers training on the advancement and modernization of IT like ChatGPT. Everything that is developed in technology shouldn’t be seen as if it is a competition with developing us as teachers, it should be a tool that we can use in the classroom. […] I would just like to add that it could be amazing if policy makers were teachers and not specifically retired teachers […] because what is on paper is not always going to work on ground level” (Lesedi (T1-P), Int-line 66 &71).

T18-Q3/4 had a similar response to what she additionally required from the DBE in hardware: “I wanted the Department of Education to provide projectors, laptops, smart board to make teaching and learning enjoyable to learners and teachers.”

Summary and analysis of teacher responses to what websites that the DBE published during the COVID-19 pandemic they made use of (Question 10).

In the analysis of teacher responses to question 10, two categories were identified: teachers either made use of Websites provided by the DBE or not. No interview data was added to this question,

as this question did not form a part of the interview schedule. Teachers that participated in the interviews either did not make use of the websites or indicated in their questionnaire response that they made use of different websites not provided by the DBE. For example, T1-P mentioned the use of 'Teacher Made' and 'Pinterest' for inspiration. Table 11 shows the distribution of the 18 teachers' responses across the different responses to Question 10 about the use of websites provided by the DBE.

Table 11

Teachers who made use of DBE provided websites.

None	Yes
10 teachers	8 teachers
T2-P, T3-P, T4-P, T5-P, T6-Q5, T7-Q5, T8-Q5, T10-Q5, T11-Q5, T16-Q3/4	T1-P, T9-Q5, T12-Q4, T13-Q4, T14-Q4, T15-Q3/4, T17-Q3/4, T18-Q3/4,

Ten teachers reported that they did not make use of any websites or resources that the DBE provided, while of the other 8 teachers only two mentioned specific resources that they made use of. T18-Q3 mentioned that she made use of "NECT and COELT to download stories, songs, rhymes and big books" while T9-Q5 mentioned that she made use of "six-bricks" and T1-P mentioned the use of Pinterest and T12-Q4 mentioned the use of Google which, however, were both not websites provided by the DBE. Of the 10 teachers that did not make use of any DBE websites T4-P mentioned the following: "No, I immediately started to do research on different ways learners can be taught and which apps would make it easier for learners to learn their subjects. I think that the pandemic hit very fast and that the Department of Education was also new to online schooling." Similar to this response was that of T5-P: "No, I jumped into using websites on my own as the Department were also not ready for what was coming however, once they suggested websites, I was already using most of them."

Summary and analysis of teacher responses to how they managed learner attendance on a rotational basis or remotely (Question 11).

Analysis of all 18 teacher responses showed three themes. Teachers reported either no rotation of learners, rotation of learners in combination with remote teaching and just learner rotation. Table 12 shows the distribution of the 18 teachers' responses across the three different response categories to Question 11 about the management of learner attendance on a rotational basis or participation in remote learning.

Table 12

How learner rotation was conducted

No rotation	Remote teaching while rotating	Rotation
5 teachers	5 teachers	8 teachers
T4-P, T5-P, T6-Q5, T7-Q5, T16-Q3/4	T1-P, T2-P, T3-P, T8-Q5, T9-Q5	T10-Q5, T11-Q5, T12-Q4, T13-Q4, T14-Q4, T15-Q3/4, T17-Q3/4, T18-Q3/4

Public school classrooms are often filled beyond their capacity. This became clear during the pandemic when schools were forced to adhere to social distancing rules in the classroom. Learners were not able to return all at once but rather had to make use of rotational learning. This allowed only a certain number of learners in the class at a time. As mentioned in Chapter II, principals were instructed to come up with a rotation system that best suited their needs. Most private schools and quintile 5 schools returned to school with full learner attendance once they were allowed to do so.

Although quintile 5 schools did not rotate learners one teacher mentioned that "learners who were booked off because of covid had to come fetch their books and their parents had to keep them up to date until they're back" (T11-Q5). T2-P mentioned that her school made use of remote teaching while rotating by using "online platform on MS Teams to accompany my lessons with online coursework. So, everything that was part of the in-person lessons, could also be found online." Similar for T3-P who stated: "We continued with the newly planned curriculum plan. Kids would be at school every second day. We would teach the ones at school and then have a slot where we would go and teach the same topic to the online class. The ones that could attend their day at school sometimes enrolled into the online class." Katarina further stated in her in-depth interview that

> "When the kids came back to school, we had half kids back. So, half of them would be online on that day. And then half would be at school. Then the next day, it would be the other way around" (Katarina (T3-P), Int-line 56).

The schools that did rotate learner attendance at the school did mention that "teachers forgot topics to teach according to their groups and learners used to forget what they have learnt the previous week" (T18-Q3). Two teachers (T15-Q3 and T17-Q3) both reported that they had to repeat the lessons. Further two teachers (T12-Q4 and T14 -Q4) reported that they explained new work to the learners that were present at school and learners that were at home were given tasks to complete. This was also confirmed by T10-Q5 who mentioned: "Work was still given weekly. Leaners would attend class every other day and work at home on the other day. Attendance was not good. Some leaners had to isolate. We covered the required math work." Nafeesah also mentioned that "we relied at lot on the parents for [completing work] […] for those two months that learners were on their own […] and it was a big problem, the children missed a lot of work" (Nafeesah (T15-Q3), Int-line 26& 28& 30).

Summary and analysis of teacher responses to how they currently manage the curriculum coverage and if they made any adjustments (Question 12)

Four themes were identified from 18 teachers' responses on the questionnaire for question 12. Some teachers reported that they made no adjustments to how they are currently managing the mathematics curriculum coverage. Majority of teachers reported that they made adjustments which included time constraints, use of ATPs or offering extra lessons. Table 13 shows the distribution of the 18 teachers' responses across the four different categories to Question 12 about the current management of mathematics curriculum coverage.

Table 13

Current curriculum coverage and the adjustments

No adjustments made	Time constraints	Make use of Curriculum adjustments	Offering extra lessons
8 teachers	3 teachers	5 teachers	2 teachers
T2-P, T4-P, T5-P, T6-Q5, T7-Q5, T9-Q5, T12-Q4, T14-Q4	T8-Q5, T10-Q5, T11-Q5	T1-P, T3-P, T13-Q4, T15-Q3/4, T17-Q3/4	T16-Q3/4, T18-Q3/4

Most teachers noted that no adjustments have been made in their post covid classroom. One teacher mentioned: “The curriculum is followed the same as always, the only thing that changed was that we had PowerPoint that we can use that came in handy” (T9-Q5). T4-P explained “there are no adaptions made. All the content is being covered” and T6-Q5 said that her “current management of content coverage is similar to the curriculum before covid. Adaptations have been made through observing each age group’s needs.”

Three teachers mentioned that they had time constraints and reported the following: “Sometimes I feel pressed with time and don’t give enough time on certain concepts” (T8-Q5). This included, as TP17-Q3 reported “slowing the place where difficult concepts are concerned.” Nafeesah further reflected on her teaching post-pandemic as follows:

> “I wouldn't say my style of teaching changed but my tempo changed but I would say my style may be a little yes I went a lot more onto their level and then a lot more practical work because remember when you have the whole class you can't do that those practical activities although we try to do them even when they are 40” (Nafeesah, (T15-Q3/4), Int-line 52).

Furthermore, teachers mentioned the use of adjusted curriculums. T1-P for example mentioned that she combined “chapters such as introducing money with addition and subtraction” and she saw the adjusted curriculum in a positive light as “you actually manage to put a bit of quality into the teaching as opposed to just ensuring that the content is covered” (T1-P), Int-line 52). Another teacher mentioned that “we use the ATP of the Department and just working slower with difficult topics like time mathematical concepts” (T15-Q3/4) and similarly for T17-Q3/4 who stated “We used the ATPs form the Education Department. Slowing the pace where difficult concepts are concerned.”

Katarina made a point that as mathematics teacher the curriculum is never really covered by saying:

> “I feel like math, you never cover [the maths curriculum] in any way, whether there was COVID-19 or not. So COVID just made it even worse [and I managed better during COVID because] I feel, and it sounds horrible, but there we didn’t know if kids fell behind because it was online. So, even though you tested [learners’ knowledge and understanding], you kind of kept going. Where now, because it is more interactive and it’s

more personal, you kind of link more to the kids […] and you don't move on until they get it right. It was easier over video, but it wasn't practical. It was very distant where this [in person] is more of a relationship so you kind of take longer" (Katarina (T3-P), Int-line 82 &86).

Lastly two teachers mentioned that they offer extra lessons "especially to children who are struggling" (T16-Q3/4) and "[for]learners who are behind to catch up" (T18-Q3/4).

Summary and analysis of teacher responses to if the mathematics curriculum could be reduced to better manage the curriculum coverage (Question 13)

Analysis of 18 teacher responses to question 13 on whether the mathematics curriculum could be adjusted and if teachers felt any topics to be no longer relevant. Two main themes were identified: no adjustment and adjustments to be made. Table 14 shows the distribution of the 18 teachers' responses across the two different responses to Question 13 about possible adjustment that could be made to the current mathematics curriculum.

Table 14

Adjustments that could be made

No adjustments	Adjustments
14 teachers T2-P, T4-P, T5-P, T6-Q5, T7-Q5, T8-Q5,T11-Q5, T12-Q4, T13-Q4, T14-Q5, T15-Q3/4, T16-Q3/4, T17-Q3/4, T18-Q3/4	4 teachers T1-P, T3-P, T9-Q5, T10-Q5

Question 13 asked the participants to share their thoughts on how the mathematics curriculum could be reduced and all, but three teachers mentioned that there are no changes that should be made to the curriculum as they find all topics relevant as T17-Q3/4 explained "all topics are equally important."

T1-P mentioned that she would like to reduce or remove the probability from the current Grade 3 curriculum as to make more time to practice the fundamental mathematics skills. T10-Q5 said that "some content could be improved to move back to more basic but effective math work." When

teachers were asked the same question in the interview Nafeesah responded that although the curriculum did change a bit "I think at the moment we are overwhelmed with work and overloaded with work" (T15-Q3/4, Int-line 60). She further went on to suggest that fractions could be reduced to ensure that learners understand the fundamental mathematics skills like whole numbers before introducing fractions and that learners often get confused with fractions (Int-line 83). Katarina felt that the whole curriculum should be revised to see what learners really need to know at a certain age group. She believes that you can cut certain topics but in a staggered manner:

> "This year we can leave this one, that one we can leave one. But I do believe numbers, numbers and operations is the one that you cannot skimp on. So that one should always be there. It's majority of the time data because it never changes really. And measurement because it always stays the same […] and geometry because […] it never changes. So that you can always skip one, bring the other one in, skip one, bring the other in. I think it's a reconstruction of what is really important [that is needed in South Africa because] the kids in our country only need 33% to pass. So, they have almost 70% that they don't know. But yet you want to bring in more complex things into the school, but they can't even cope with the basic things yet" (Katarina (T3-P), Int-line 94 & 98).

Although all other teachers focused on mathematics content when answering this question, T9-Q5 mentioned that life skills topic "post-pandemic […] about hygiene and masks was no longer relevant."

Summary and analysis of teacher responses to what support they are currently receiving from the DBE or their school (Question 14)

In the analysis of teacher responses to question 14 on the support that teachers are currently receiving in terms of catching up last teaching time, three categories were identified namely: no support (with a sub-theme of teachers taking their own initiative to provide extra lessons), taking part in workshops and making use of adjusted curriculums. Table 15 shows the distribution of the 18 teachers' responses across the different responses to Question 14 on advice or support teachers are currently receiving to catch up lost teaching time that occurred during the pandemic.

Table 15

Advice or support teachers are currently receiving to catch up lost teaching time

No support		Workshops	Curriculum adjustments
none	teachers own initiative		
7 teachers T2-P, T4-P, T5-P, T8-Q5, T10-Q5, T15-Q3/4, T17-Q3/4	5 teachers T7-Q5, T9-Q5, T16-Q3/4, T17-Q3/4, T18-Q3/4	3 teachers T12-Q4, T13-Q4, T14-Q4	3 teachers T1-P, T3-P, T6-Q5, T11-Q5

Teachers who reported not receiving any support in catching up lost teaching time did so for different reasons. Some teachers such as T4-P reported "No work was lost during the pandemic because we continue as normal with online teaching". In support of this T5-Q5 expressed "There is no need to catch up as we never cut the curriculum. The normal curriculum was followed right through the pandemic." Another teacher felt "[further support] is not necessary with the current Grade 3 group" (T10-Q5).

Five teachers mentioned that they received no support from the DBE but rather "provide those learners [that have not yet fully understood concepts] with extra classes in order to support them" (T7-Q5) and "have extra classes to help learners who might struggle" (T9-Q5). This was further seen by T16-Q3/4 who mentioned that she is "giving extra lessons every day and homework."

Some teachers stated that they still made use of adjusted curriculums such as T6-Q5 who said "Lost teaching time is combined with day-to-day activities and the curriculum. No extra school hours or educational changes was needed to adapt after covid and lockdown."

Summary and analysis of teacher responses to how they perceived the differences in learners mathematical learning (Question 15)

In Table 16 the distribution of teacher responses as to their perceived differences are shown across two main categories – with two subcategories (negative and positive) for those who perceived a difference. Table 16 shows the distribution of the 18 teachers' responses across the different responses to Question 15 about the difference in learners mathematical learning now compared to that of 'pre-COVID-19' learners.

Table 16

Difference in learners mathematical learning compared to pre-COVID

No difference	Yes difference	
5 teachers T8-Q5, T10-Q5, T12-Q4, T13-Q4, T14-Q4	negative	Positive
	10 teachers T1-P, T2-P, T3-P, T4-P, T5-P, T6-Q5, T7-Q5, T11-Q5, T16-Q3/4, T18-Q3/4	3 teachers T9-Q5, T15-Q3/4, T17-Q3/4

Four teachers mentioned that they don't notice a significant difference in learners mathematical learning. T11-Q5 did mention, however, that "learners expect to receive everything and don't want to think and figure it out for themselves."

Of the teachers that did report a difference in learners mathematical learning, 10 mentioned a negative experience. T18-Q3/4 stated: "Yes, there is a vast difference because during the pandemic some topics were removed and we did not support learners with barriers, we were just pushing the curriculum coverage." Katarina mentioned in her interviews that learners "don't retain information. They have challenges to actually remember like their long-term memory has been, I don't know, like impacted. And they don't know their multiplications and their bonds. And I think if they, the ones that weren't closed during that time were kind of like forced through it. So, the basic part of math is not there. And because they can't retain, they struggle to remember the multiplication and the bonds" (T3-P), Int-line 96).

This is further supported by T4-Q5: "Learners are struggling more than before. I think the concepts were taught online, but they did not much attention because they were at home." Further T16-Q3 mentioned that "learners are too slow compared to previous times before COVID-19." Nafeesah explained that children missed a lot of work, and it happened often that learners missed a day of rotational attendance and therefore missed the instructions to new work and those children would be very confused when coming back the following week. She further went on to explain:

> "A lot of children had gotten used to the little work and the little learners in the class […] and I think the government is doing the learners wrong […] because they have felt what it

is like to be less children in their class and how to get more attention in class" (Nafeesah (T15- Q3), Int-line 30&40).

Three teachers did, however, report a positive change on the learners' mathematical learning. T15-Q3 said: "I would say they perform better when they were smaller groups during the pandemic. We had more time to help learners that struggled with some concepts." Although T13-Q3/4 had a different response in her questionnaire, this was confirmed in her interview. Nafeesah mentioned: "I think the learners that went through COVID can cope a lot better. These that actually came in and did their work […] made it fun to work with them because they were in smaller groups. I really hoped the department would keep it that way with the 20 learners but instead they topped up all the 20 learners with another 30 learners." She added:

> "During the COVID time you could accomplish much more because of the smaller groups that we had. One can say in a weird way it was a good time. Except for the fact that children got sick and things like that. It was actually a good time […] it wasn't just a bad time. […] We are finding ourselves in this time now and we can see the difference and how weak the people are getting, and we can say the department is doing a lot of nonsense from what we did and how we adapted and how we taught and were taught" (Int-line 94&96).

Similarly, Elena mentioned the following in her interview regarding the differences in learners' mathematical abilities post-pandemic:

> "So positive maybe. Only that this generation, which is currently in class three four, which was strongly affected by it at that time, has become much better in its media competence. But that has nothing to do with maths, but I would say that in any case, and also more flexible learning, that it is easier for the children nowadays when they have a source and material and they are supposed to pick something out here, that they can then work with it more flexibly, because I think they know this independent work better" (T2-P, Int-line 20).

Another teacher mentioned that she noticed a bettering in mathematics but a struggle in the learners reading especially when reading instructions (T9-Q5). Lastly T17-Q3/4 stated that "it was easier to managed and assist the learners when they were in smaller groups. We could easily detect a problem" during the pandemic when learners attended lessons on a rotational basis.

Summary and analysis of teacher responses to how they adjusted their teaching methods in the past pandemic classroom (Question 16)

In the analysis of 18 teachers' responses to the last question on the questionnaire, two categories of response were identified. Teachers either adjusted their teaching methods post COVID-19 pandemic or resorted back to their teaching style as it was pre-pandemic. Table 17 shows the distribution of teachers' responses to how/if they adjusted or changed their teaching methods in the post-pandemic classroom.

Table 17

Teachers adjusting their teaching methods

No change	Yes changed
6 teachers	12 teachers
T8-Q5, T11-Q5, T13-Q4, T15-Q3/4, T16-Q3/4, T17-Q3/4	T1-P, T2-P, T3-P, T4-P, T5-P, T6-Q5, T7-Q5, T9-Q5, T10-Q5, T12-Q4, T14-Q4, T18-Q3/4

A third of the participants mentioned that they noted no change in their teaching. T16-Q3/4 found this unsettling noting: "It didn't change, it actually disturbed me a bit, however, it was fine eventually."

Two thirds of teachers, however mentioned that they did adapt their teaching in the current post-pandemic period. Of these, six participants mentioned that they focused more on teaching concrete rather than abstract mathematical concepts. "Not quantity but quality" (T12-Q4) became important to them. More focus on concrete examples in their classes was also mentioned by T1-P "I have become much more flexible with pacing learners and incorporating real life experiences to the classroom" and by T7-Q5 who now uses more concrete examples when giving one-on-one support through the use of extra lessons.

The other six participants (who changed their teaching) noted different ways in which they adjusted their teaching methods. These included flexible teaching, understanding learners who work at a slower pace and making use of technology in the classroom.

Nafeesah, for example, mentioned in her interview: "I wouldn't say my style changed but my tempo changed […] I went a lot more onto their level and then [did] at lot more practical work" (T13-Q3- I, Int-line 52). This was also mentioned by T1-P "I have become much more flexible

with pacing learners and incorporating real life experiences to the classroom [and] I have more understanding for learners who work slower. I use more technology in my lessons than before." (T4-P). Katarina reported that she still makes use of videos in her lesson as she feels "you reach kids sometimes more with the video or with a different way of explaining it" (T3-P), Int-line 66) and "since the scholars are more used to technology, I do try to implement technological aspects in the lesson" (T3-P).

Most teachers have shown a shift to renewing their teaching styles in the post-pandemic classroom. As Level 6 of the levels of use in the CBAM shows. Teachers on this level try to seek more effective ways teach and integrate what they have learnt and used during the pandemic into post-pandemic classroom. The focus of these teachers is for teaching and learning to take place and to continue taking place regardless of the circumstances.

6.2 Insights from Interviews

As mentioned in the methodology in Chapter IV, interviews were not analysed separately but rather in combination with the questionnaires. One interview response that captures well how many teachers felt about policy makers was noted by Lesedi:

> "It could be amazing if policymakers were teachers and not specifically retired teachers. You know that they are actively in the profession of teaching because what is on paper is not always going to work on ground level." (Lesedi (T1-P), Int-line 71)

Of note was that all teachers gave a similar response of frustration and little understanding and support from policy makers in the interviews. Their responses were included in the analysis as a way to show possible points of improvement for future classroom policy making.

Summary and analysis of teacher interview responses to further comments they would like to give to policy makers.

This section was added from the interview responses teachers gave when asked whether they would like to give any comments to policy makers for the future. Interestingly all five teachers felt that policy makers were no longer in-touch with what is happening in schools, however there are some slight differences in the nature of the responses that I share below.

Katarina explained with some frustration highlighting the way in which children's needs have changed over time with little recognition from the DBE of these needs:

> Are they (DBE) still actually in schools? Do they know what's going on? Do they have their own idea? Do they have a fantasy image of what they would like the schools to be? And then they think it's like that. I think they are detached from reality. I think they do not know the pressure because they always load, and they don't really understand what we deal with. Because it's not your normal kids of 40 years ago. They have emotional needs. They don't have manners and discipline. So, we need to teach that. Like there's all the admin. It's a lot of things that take time from actual teaching. So yeah, I think they need to be taken to reality again. (Int-line 104)

Nafeesah similarly expressed frustration at the seemingly unfair expectations placed on teachers and the pressure they feel of teaching with limited time given for learners to master mathematical concepts:

> Leave us to practice. When you're not even done with plus then we need to move to minus again. It's not even been mastered then you need to move to timetables again. But nothing has been mastered but they expect the learners to have understood everything. So, we are aware that we have to cover all the work just give us the time to do that. Just enough time to finish a concept. It's really frustrating when you have jut taught a concept and have the feeling the learners are starting to understand then they come and ask you were the next work is. It's just a rush the whole time and nothing is being mastered at all. I think it's a really big problem. (Int-line 137).

Further comments addressed the need for policy makers to address the fact that the pandemic has caused classrooms to become multi-grade level classrooms, filled with learners of different backgrounds with different needs, without the curriculum speaking to these challenges. Fatima felt that policy makers have little understanding of learners' backgrounds and needs:

> Please come and visit our schools. They have to come down to our level. They cannot just think of things and write them down and send them to us. You must have a bit of background and understanding of how far the children are and with what type of children you are working. (Int-line 130).

Similarly, Elena explained her frustration with teaching in a classroom with learners coming from multiple cultural and socio-economic backgrounds:

> So, the bottom line is that the […] the children come from all kinds of different backgrounds, socio-economic backgrounds, family backgrounds. They all grew up differently, somehow or other linguistic conditions, and you have to absorb that somehow in the lessons, and all of that was reinforced by Corona. So that was amplified in the pandemic and that's why it's so acute and so topical at the moment. And I think that many at the higher levels have no view and no understanding or simply no comprehension of what this means in practice. They know that this is the situation, but they don't know how it affects teaching and the teaching process. (Int-line 76)

From Elenas response, it becomes clear that teachers all over the world, not just in South Africa, are faced with similar problems such as classrooms filled with learners from various backgrounds and that these challenges need to be addressed when structuring the curriculum.

It becomes clear from these responses that teachers feel left in the dark by those that should be guiding them. They feel that policy makers are no longer aware of the conditions that teachers face in the classroom and seemingly do not have the best interest of the learner or teacher in mind. Teachers noted that while policy guidelines can look good on paper they cannot always be implemented practically in the classroom. Teachers overall expressed that they were overwhelmed by the workload, seemingly unrealistic expectations, and felt their teaching conditions were not appreciated or understood by policy makers on school, district and government level. Taking the evidence into account it becomes clear that teachers are facing many challenges when it comes to managing the curriculum content, not just in mathematics but in all subject areas in Grade 3.

The next chapter will summarise the study, providing insights into practical implications and theoretical significance. Moreover, it will propose actionable recommendations for future research endeavours that could build upon the evidence presented, thus fostering continued advancement in the field of managing curriculum content while teachers are face many challenges.

CHAPTER VII: CONCLUSION AND RECOMMENDATIONS

Introduction

In this chapter I provide a brief overview of the findings and give suggestions for possible further research. I further gave a personal reflection of the study and round off with a conclusion.

7.1 Summary of findings

The study drew on three main data collection methods in order to answer the posed research question and five sub questions. The first section focused on sub questions a and c. To answer this question an in-depth analysis of all documents provided by the DBE was made.

7.1.1 Analysis 1: Policy communication and teacher support

Research question a: What policy and documentation were provided to schools and teachers about teaching and curriculum coverage during the pandemic?

The DBE provided a wide range of documents that focused on adjusting the content coverage to better suited the adjusted school calendar. It was evident that the greatest adjustment to the curriculum in the ATPs was that of 2020. The data showed that the highest number of school days was lost during this year. In all the documents that the DBE provided, some discrepancies were found. First was the number of school days allocated per school year. The ATPs were based on the maximum number of school days available, although these did not correspond with the actual number of school days especially in the lower quintile schools where learner rotation was done until February 2022. This means that private schools and schools in quintile 5, who have less learners in a classroom and did not need to use rotational learning, had better opportunity to use the adjusted curriculum appropriately. Whereas lower quintile schools had less contact time with the learners therefore less opportunity to complete the adjusted curriculum.

Secondly discrepancies were identified in the ATPs. Notable adjustments were identified in content areas such as numbers, operations, and relationships, geometry, measurement, and data handling. Changes included a reduction in the number range, alterations to geometry coverage, and fluctuations in the inclusion of measurement components. Data handling skills were also modified, with shifts to an emphasis on collecting, representing, and analysing data.

The reduction in number range as seen in the 2020 ATP, was likely an attempt at adjusting teaching to accommodate lost teaching time. However – a simple reduction in number range does not necessarily save teaching time as the concepts that need to be taught and the principles underlying

them remain. For example, shifting from being able to read, write and say numbers from 999 to 500 does not save time unless students are actually writing out every number. If one learns how to read, write and say numbers to 500 one can also do this for example for 824 or 998. The reduction implies that teachers and students would be writing out, counting all number names and symbols instead of focusing on the concept of writing numbers and counting. Additionally, the 2021 ATP showed a discrepancy in order on the topic of geometry where the order of 2D shapes and 3D objects was changed without explanation. It is unclear whether this was done intentionally or if it was a mistake. It would be illogical for teachers to first introduce 3D objects before having introduced 2D shapes, as one should build on the other.

Similarly, the fluctuation in the inclusion of measurements in the ATPs for different years, was unclear. It seems as though in the later ATPs area and perimeter are no longer relevant to the Grade 3 mathematics curriculum, as these were excluded in both the 2022 and 2023 ATPs. Yet no related adjustments were made in the later grades to accommodate for this omission. After having analysed the curriculum, it also became clear, that the content of data handling was significantly reduced during the pandemic and has only fully been reintroduced in the 2023 curriculum. One can assume that focus was placed on other areas of the curriculum until schools no longer made use of rotational learning.

Research question c: How were teachers supported (if at all) by the DBE or schools to manage continued teaching and learning during the pandemic?

On paper it seems like teachers were given sufficient guidelines to be able to manage the curriculum coverage during the pandemic. Despite the provision of important information, the study notes a lack of specific guidance on distance education and the implementation of the curriculum during rotational learning.

In summary, the analysis of documents from the DBE website highlights significant adjustments in curriculum planning, school calendars, and teaching methodologies during the pandemic. The study identifies challenges in maintaining continuity, optimal learning, and curriculum coverage, with teacher responses indicating a degree of non-compliance with the provided ATPs.

7.1.2 Analysis 2: Management of content coverage

Research question b: How did teachers manage mathematics content coverage during the pandemic?

Teachers from different quintile schools managed the mathematics content coverage differently. Most teachers in quintile 5 schools reported that they managed the curriculum well, with little to no backlogs. Most teachers in this quintile reported that they were able to continue mathematics teaching remotely by making use of PowerPoint presentations and video tools such as MS Teams. These teachers also mentioned that the adjusted ATPs were sufficient support from the DBE for them to manage covering the curriculum.

Some teachers in quintiles 3 and 4 reported the use of ATPs to manage the curriculum coverage. While others stated that they offer extra lessons to learners who have gaps in their understanding of mathematical concepts. Although these teachers were impacted the most by the closure of schools and the rotation of learners, most did not see the pandemic as a negative thing. Some teachers felt that they had enough time during contact lessons on a rotational basis to engage with learners who are struggling with certain concepts. Smaller classes meant that no child was lost in the masses. Teachers from these quintiles emphasised the need for smaller classes even post-pandemic.

Surprisingly teachers in the private sector, from well-resourced schools who made use of remote teaching, still reported a gap in learners' current mathematical knowledge. However, most of the teachers in the private sector also reported that they never truly cover the mathematics curriculum in the way stipulated but have the freedom to shuffle content around.

Research question d: How are teachers managing mathematics content coverage currently? And what pandemic emergent strategies are teachers continuing to use in their current practice?

Most teachers mentioned that they reverted to their old methods of teaching with few teachers reporting adjusting the pace at which they teach or being more patient with learners that show signs of not having understood previous mathematical concepts. Teachers indicated that they have learnt to become more flexible in their teaching and found it important to focus on the fundamentals of mathematical teaching.

Research question e: What role did/does technology play in research questions b, c, and d?

Technology played a vital role in the continuation of mathematics teaching during the pandemic. In well-resourced schools, teachers indicated that they used technology to teach remotely with the use of either synchronous or nonsynchronous video tools. All teachers that participated reported the use of some form of technology to communicate with parents, colleagues and learners. As

WhatsApp was a form of low-cost communication tool, it was used by majority of teachers to send out instructions and tasks for learners to complete at home. Synchronous video tools such as MS Teams and Zoom were used by teachers in private and quintile 5 schools, where most students also had access to such tools. These tools allowed teachers to continue with the stipulated curriculum coverage remotely in some way. Where such tools were not available, the impact of COVID-19 and loss of teaching time will be even more significant. Teachers that have the resources, mentioned that they make use of PowerPoint presentations and videos they created or used during the pandemic. A limited number of teachers reported still making use of synchronous video tools for teaching.

To conclude the summary, I return now to answer the main research question which is informed by the findings from the various sub-questions discussed above.

Main Research question: How did Grade 3 teachers manage curriculum coverage during the pandemic and how are they managing this currently in the post-pandemic context?

Overall teachers expressed feeling overwhelmed with the unrealistic expectations placed on them when teaching Grade 3 mathematics. Participants mentioned gaps in learners mathematical understanding that need to be addressed while also feeling the pressure of having to complete the stipulated mathematics curriculum. Similarly, Hadisaputra (2024) found in a study done in Indonesia, that teachers are overloaded with the responsibility of having to prepare lessons and create and mark assessments, that they have little room left to effectively manage the curriculum content. As previously mentioned, where the resources were available teachers stated that they managed the content coverage better than the teachers who had limited access to technology. When looking at the resources the DBE made available to teachers, it appears that policy makers were not sufficiently in tune with the situations in schools in terms of a lack of access to internet resources and opportunities for remote teaching. Many suggestions were highly dependent on rich resources and technological infrastructure. Although the ATPs were helpful to teachers, the illogicality of some adjustments showed a lack of understanding of what teachers needed to cover the core of the curriculum. This was further echoed by teachers who participated in the interviews and called for policy makers to reevaluate what is truly important in teaching mathematics successfully.

The evident lack of support from the DBE, as stated by the teachers in this research, forced teachers to become flexible and resilient in their own teaching and supporting each other rather

than depending on the school or the DBE. The realisation that teachers were left to somehow manage the curriculum seemingly caused a shift in the mindset of most teachers.

When looking at the teacher data in relation to the CBAM levels of use, many teachers started out displaying a lack of agency in relation to the fear of the pandemic. Some teachers felt powerless in the attempt to somehow teach in the midst of a global pandemic. As the pandemic prolonged these teachers showed a clear attempt of using the ATPs in an attempt to salvage what they could of the academic year. Some teachers that started on CBAM level 0, where adapting teaching was not considered a priority for them, progressed to level 5 by integrating either synchronous or nonsynchronous methods of teaching into their everyday routine. Even teachers that had a clear understanding of their responsibilities of continuing teaching in the height of the pandemic by taking resources home (level 3 of the CBAM levels of use), showed their progression from integrating teaching (level 5) to renewing and adjusting their teaching strategies post-pandemic (level 6). In conclusion, most teachers became flexible in their teaching and were able to manage covering the mathematical content to the best of their abilities with the resources they had available. These findings point to many strengths in the resilience and adaptability of South Africa's mathematics primary teachers.

7.2 Contribution of the study

The study contributes empirically to the field of mathematics education in that it analysed the challenges posed to teachers regarding the content coverage in mathematics during and post-pandemic and further analysed how teachers Grade 3 mathematics teachers are managing and managed the set mathematics curriculum during and post-pandemic. The focus was placed on Grade 3 as this grade level forms the final year in the foundation phase and all foundational mathematics skills and knowledge should be mastered by the end of this year. The study also found that, while understandable with the sudden change needed during the pandemic, the DBE communication with teachers in terms of communicating guidelines was problematic. Some communication was found to be contradictory while other information was unclear in terms of guidelines. Furthermore much did not reach teachers which left teachers having to navigate for themselves appropriate ways to respond to school closures and reduced curriculum coverage.

The study makes a theoretical contribution in its adaptation of the CBAM model for teachers' management of content coverage through adoption of distance education possibilities (including through technology).

7.3 Implications

The implications of the study are separated into two parts. Firstly, the implications for teachers and then the implications for the DBE and policy makers.

7.3.1 For teachers

As teachers were affected by the sudden shift from face-to-face learning to remote teaching, the study highlights several implications for teachers: There is a need for teachers understand their role in managing the curriculum content to ensure that learning loss is mitigated, thus emphasizing the crucial role of educators in addressing the educational challenges highlighted by the study. Teachers need to be aware of the curriculum content and understand the learning level of learners to be able to pick up were the learner's current knowledge as to not create larger learning gaps by just rushing to complete the curriculum. Furthermore, teachers need to be included in the decision making in terms of curriculum development and possible adaptations to it necessitated by possible future pandemics or crises that may result in school closures.

7.3.2 For the DBE and policy makers

Although the DBE sent out a lot of circulars, adjustments to the year plan and guidelines for teachers and schools on how to adjust teaching during the pandemic, these did not always reach teachers and furthermore were not always communicated in a manner that was useful to teachers. Therefore, the DBE should work on setting up effective websites that are accessible to teachers. This includes providing teachers and schools with the necessary internet access to be able to access these websites. The DBE's support structures were not of a nature that assisted teachers to be able to continue teaching in an effective manner. The DBE should therefore put structures in place that teachers can fall back on should face-to-face teaching be required again. This could be due to weather conditions, national strikes or another pandemic that prevents learners and teachers from accessing the school premises to collect workbooks, as to not lose out on valuable teaching time.

The study further highlighted the need for policy makers in the education sector to communicate more with teachers on the ground in order to better understand the needs of both learners and teachers during times of crises. This can be done by doing regular school visits, providing schools with internet access and involving teachers in decision-making.

7.4 Suggestion for further research

A limitation of this research was the relatively small sample of teachers and the absence of teachers in Quintile 1 and 2 schools. This was not due to a lack of invitation to teachers in these schools. It is crucial to explore strategies for establishing partnerships with teachers in Quintile 1-3 schools. Understanding the challenges, they encounter is essential for future research endeavours. The pandemic has shifted the way in which technology is used in most schools and classrooms to varying degrees. Understanding how to support teachers across all quintiles in how to maximise technological opportunities in order to support 'catch-up' due to losses of teaching time is important and particularly important in poorer (lower quintile) schools where resources are limited and where the greatest loss in teaching time was experienced. Thus, further studies should be made win schools in quintile 1-3 schools in rural areas who had even less access to resources, internet and parent communication. The study could also be extended to higher grades to see the way in which high school teachers are managing the mathematical content coverage in preparation for the matric exams. A similar study could be made on the way in which teachers are managing teaching languages to learners in Grade 3 who had little to no contact teaching time during Grade 1 and 2 and relied on parents to teach letters and sounds.

7.5 Personal reflection

Embarking on the journey of conducting a master's thesis on "Investigating Teachers' Post-Pandemic Management of Mathematics Content Coverage in Grade 3" has been a profound and multifaceted experience. The primary objectives of the study included exploring the Department of Basic Education's DBE response to the pandemic in terms of advising teachers on continued teaching and learning policies, examining how teachers navigated the mathematics curriculum during the height of the COVID-19 pandemic, investigating their strategies in the post-pandemic classroom, and exploring the use of teaching tools and methods adopted during the pandemic.

One of the most prominent struggles encountered throughout the research process was the reluctance of teachers to participate, resulting in a limited number of participants. This limitation significantly impacted the breadth and depth of the study, making it challenging to draw comprehensive conclusions. The frustration stemming from schools' hesitancy, coupled with prolonged waiting periods for consent from both the DBE and individual schools, added layers of complexity to the research timeline.

The timing of approaching teachers also proved to be a considerable hurdle. Contacting teachers just before the winter holidays and then again shortly before the October holidays inadvertently clashed with crucial periods in the academic calendar. Teachers, understandably overwhelmed with marking and administrative tasks, felt pressed for time and were less inclined to participate in the study. Despite efforts to extend the outreach after the June holidays, the process of obtaining gatekeeper permission from schools was time-consuming, limiting the window for teacher interviews.

The interviews, conducted between August and September, provided insight into different teachers' perspectives of having taught mathematics during the pandemic and offered understanding of the challenges and innovations in mathematics education post-pandemic. However, the desire to conduct more interviews and capture a broader spectrum of experiences was hindered by the reluctance of many teachers to allocate additional time for the study.

An additional layer of complexity arose from the time gap to the pandemic. Many teachers struggled to recall specific details, leading to inconsistencies between questionnaire responses and interview statements.

In reflection, while the journey was fraught with challenges, it was also marked by moments of insight and personal growth. As a teacher, I understand that teachers are under enormous pressure and finding time to participate in research for which there is no clear benefit to their work as a teacher, is a challenge for them. It points to the need for establishing partnerships with teachers or professional learning communities that provide mutual learning opportunities to which research can be added. Navigating the intricate process of obtaining consent, facing setbacks, and adapting to the evolving dynamics of educational settings provided invaluable lessons in resilience and adaptability. The frustrations encountered in participant recruitment underscored the unpredictable nature of research, emphasizing the importance of flexibility and strategic planning.

Despite some limitations, the study has contributed to a deeper understanding of post-pandemic mathematics education in Grade 3, highlighting the need for more nuanced approaches and continued support for educators. The journey has been a testament to the complexities inherent in educational research and the importance of perseverance in the pursuit of knowledge. The findings have furthermore challenged deficit perspectives of teachers and shown their resilience, adaptability and care for their students' education and well-being at a time of enormous

uncertainty and the way in which these experiences continue to inform their pursuit of quality mathematics teaching and learning.

7.6 Concluding remarks

In conclusion the study sought to understand the challenges faced by Grade 3 mathematics teachers in managing the curriculum content during and after the COVID-19 pandemic. The investigation revolved around the policies and guidelines provided by the DBE, teachers strategies for content coverage and the role of technology during and post-pandemic. The study highlights the need for policy makers to be actively engaged in the field, actively engaging with teachers' needs and aligning their strategies with the situation faced by teachers and learners.

Despite limited school response and teacher participation, the research has contributed valuable insights into post-pandemic mathematics education, emphasizing the need for nuanced approaches and continued support for educators.

In essence, this study serves as a snapshot of a momentous time in education, capturing the resilience and adaptability of Grade 3 mathematics teachers. As I conclude this study it is evident that the journey of understanding the post-pandemic landscape in mathematics education is ongoing, with further research needed to unravel its complexities and inform future education strategies.

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APPENDICES

APPENDIX 1: GATE KEEPER PERMISSION

Permission letter from Rhodes University

Rhodes University, Education Faculty
Research Ethics Committee
PO Box 94, Makhanda, 6140, South Africa
Tel: +27 (0) 46 603 8393
Fax: +27 (0) 46 603 8028
email: e.rosenberg@ru.ac.za

https://www.ru.ac.za/researchgateway/ethics/

15 May 2023

inge damaske

Education Department

g23d9007@campus.ru.ac.za

Dear Ms Inge Damaske

Re: Investigating teachers' post pandemic management of mathematics content coverage in grade 3

APPLICATION NUMBER: 2023-7107-7523

This letter confirms that your research ethics application has been reviewed and **APPROVED** by the Education Faculty Research Ethics Committee (EF-REC). Your permission letter(s) where applicable have been received and you are free to proceed with your study.

Approval is granted for 1 year. An annual progress report is required in order to renew approval for an additional period. You will receive an email notifying you when the progress report is due.

Should any substantive change(s) be made during the research process, that may have ethical implications, you should notify the Education Faculty REC Chair via email. This includes changes in investigators. The REC Chair will advise as to whether a new application is necessary.

Do keep this clearance letter secure and accessible throughout your study and after its completion. It will be needed when a thesis is examined and when publications are submitted to journals.

Please also submit a brief report to the REC Chair on the completion of the research. This can be done via email. The purpose of this report is to indicate whether the research was conducted successfully and whether any ethics-related matters arose that the committee should be aware of, in order to guide future studies.

Sincerely,

Prof Eureta Rosenberg

Chair: Education Faculty Research Ethics Committee

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

R/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**25 April 2023**
Validity of Research Approval:	**08 February 2023– 30 September 2023** **2023/147**
Name of Researcher:	**Damaske IG**
Address of Researcher:	**534 Jonathan Street**
	Waterkloof Glen
	Pretoria
Telephone Number:	**081 586 3348**
Email address:	**Ingedamsake@gmail.com**
Research Topic:	**Investigating teachers' post-pandemic management of mathematics content coverage in Grade 3**
Type of qualification	**Masters**
Number and type of schools:	**8 Primary Schools**
District/s/HO	**Tshwane 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.

25/04/2023

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

.....

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

DATE: 25/04/2023

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: PRINCIPAL APPROVAL LETTER

RHODES UNIVERSITY
Where leaders learn

ACCESS LETTER REQUESTING PERMISSION TO CONDUCT RESEARCH

Rhodes University
Drosty Road,
Grahamstown,
6139

Date May 2023

Dear Principal

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I am a registered Master's student in the Department of Primary and Early Childhood Education at the Rhodes University. My supervisor is Prof. Mellony Graven.

The proposed topic of my research is:
Investigating teachers' post pandemic management of mathematics content coverage in grade 3
The objectives of the study are:

(a) To understand how teachers managed mathematics content coverage during and post pandemic.
(b) To investigate what resources were used to manage the content coverage.

I am hereby seeking your consent to invite teachers from your school to participate in a questionnaire and interview. To assist you in reaching a decision, I have attached to this letter:

(a) A copy of an ethical clearance certificate issued by the University
(b) A copy the research questionnaire which I intend using in my research

I would ask that you identify grade 3 mathematics teachers that have been teaching mathematics from 2019 until now. The teachers should be filling out the questionnaire in their own time. Should you not have printing facilities or access to the internet for teachers to fill out the questionnaires online, I am willing to send printed copies to you and to collect them again once they have been filled out.

Rhodes University, Research Office, Ethics
Ethics Coordinator: ethics-commitee@ru.ac.za
t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707
Room 220, Main Admin Building, Drostdy Road, Grahamstown, 6139

RHODES UNIVER
Where leaders learn

The potential benefits of the study are to inform how teachers might manage future pandemics better in terms of mathematics education. You will have an opportunity to engage with the results of the research findings in a manner that suits you.
Thus, for example, you will be provided with the report, a summary slide show of the key findings and I would be willing to make a presentation to you and the fellow teachers at your school should you request this.

Should you require any further information, please do not hesitate to contact me or my supervisor. Our contact details are as follows:

Inge Damaske
ingedamaske@gmail.com
0815863348

Prof. M. Graven
m.graven@ru.ac.za

Upon completion of the study, I undertake to provide you with a feedback of the outcomes fo the study.

Your permission to conduct this study will be greatly appreciated.

Yours sincerely,

Inge Damaske — Damaske

Name **Siganture**

Approved by

[redacted] — [redacted] — 29/08/2023

Principal name **Signature** **Date**

Rhodes University, Research Office, Ethics
Ethics Coordinator: ethics-commitee@ru.ac.za
t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707
Room 220, Main Admin Building, Drostdy Road, Grahamstown, 6139

APPENDIX 3: TEACHER CONSENT DECLARATION

RHODES UNIVERSITY
Where leaders learn

PARTICIPANT INFORMED CONSENT DECLARATION

(To be signed by research participant/s)

Project Title:
Investigating teachers' post pandemic management of mathematics content coverage in grade 3

As a fellow grade 3 teacher, I have become interested in the how teachers managed the stipulated curriculum coverage in grade 3 mathematics during the pandemic and how they are continuing to manage this post pandemic. This includes identifying how much and what type of support teachers were given from various stakeholders in the primary education system. Here the levels of support from school principals, governing bodies and more importantly the Department of Basic Education will be analysed.

I hope to learn from other teachers' experiences in order to understand teacher experiences more broadly than my own and in this process, I am studying for my master's degree and will use the data, with your permission in my thesis.
As an invited research participant, should you agree to participate I will request that you fill in a questionnaire in the method of your choice (on paper, online, via WhatsApp voice note, on a recorded phone call or any other means that is comfortable to you). Thereafter you may be invited to an interview, at a place (or telephonically) and time that suits you.

The potential benefits of the study are to inform how we as teachers might manage future pandemics better in terms of mathematics education. As a participating teaching you will have a chance to reflect on your teaching during and past the COVID-19 pandemic and will have an opportunity to engage with the results of the research findings in a manner that suits you. Thus for example, you will be provided with the report, a summary slide show of the key findings and I would be willing to make a presentation to you and the fellow teachers at your school should you request this.

Inge Damaske (23D9007) from the Department of Primary and Early Childhood Education, at Rhodes University has requested my permission to participate in the above-mentioned research project.

The nature and the purpose of the research project and of this informed consent declaration have been explained to me in a language that I understand.
I am aware that:

1. The purpose of the research project is to understand how mathematics content coverage was managed by teachers during and post pandemic.

2. Rhodes University has given ethical clearance to this research project ***2023-7107-7523*** and I have seen/may request to see the clearance certificate by contacting the Ethics Coordinator (ethics-committee@ru.ac.za)

Rhodes University, Research Office, Ethical Review
Ethics Coordinator: ethics-commitee@ru.ac.za
t: +27 (0) 46 603 7727 f: +27 (0) 86 616 7707
Room 204, Main Admin Building, Drostdy Road, Grahamstown, 6139

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3. By participating in this research project, I will be contributing towards understanding what support teachers might need to manage content coverage better and what tools they might need to do so and how future pandemics or emergencies can be better handled.

4. I will participate in the project by completing a questionnaire and possibly being a part of an in-depth interview.

5. My participation is entirely voluntary and should I at any stage wish to withdraw from participating further, I may do so without any negative consequences.

6. I will not be compensated for participating in the research, but my out-of-pocket expenses for transport will be reimbursed.

7. The following risks are associated with my participation: no risks are foreseen

8. The Researcher intends to publish the research results in the form of a thesis that will be kept on a password protected USB. However, confidentiality and anonymity of records will be maintained and my name and identity will not be revealed to anyone who has not been involved in the conducting of the research, ***unless I indicate to the contrary/recognize that as a public figure my identity will inevitably be/become known, in which case I agree to accept the loss of anonymity.***

9. In terms of the Protection of Personal Information Act (No. 4 of 2013) it remains my right to request the Researcher to provide me with a detailed explanation of exactly how confidentiality and anonymity of the data I provide will be achieved. I may also request to know exactly how my personal information will be stored securely, for how long it will be stored.

10. If any data collected from me for this research project is to be used by the Researcher for any further study, I am to be informed in writing and my written consent requested again. I need not give consent for the new research if it is incompatible with the initial purpose of the present study (POPIA, s15(3)). Equally, I can simply reject the request. In such cases, a formal request needs to be made to me by the researcher via the Ethics Coordinator (ethics-committee@ru.ac.za).

11. In terms of the POPI Act, I possess the right to receive feedback about this research. This will take the form of a password protected document sent via email unless ***I elect not to receive this feedback.***

12. Any further questions that I might have regarding the nature of the research and/or my participation in it will be answered by Inge Damaske via g23d9007@campus.ru.ac.za.

13. By signing this informed consent declaration, I am not waiving any legal claims, rights, or remedies. A copy of this informed consent declaration will be given to me, and the original will be kept on record by the Researcher.

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14. I ***agree/disagree*** (delete inapplicable) to the Researcher's request to take photographs, or videoing me as part of this research project, recognizing that agreement here is likely to raise the risk of compromising my anonymity and that steps will be taken to ensure this will not happen it my consent is given.

15. I ***agree/disagree*** (delete inapplicable) to the Researcher's use of voice recording of my comments and opinions during interviews, the purpose of which is to ensure the accurate recording of my views/responses. Furthermore, I have the right to request a copy of the interview transcriptions to confirm that my opinions are accurately recorded

I, [redacted], have read the above information / confirm that the above information has been explained to me in a language that I understand and I am aware of this document's contents. I have asked all questions that I wished to ask, and these have been answered to my satisfaction. I fully understand what is expected of me during the research.
I have not been pressurised in any way and I voluntarily agree to participate in the above-mentioned project.

[redacted]	[redacted]	11/09/2023.
Participants signature	**Witness**	**Date**

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APPENDIX 4: QUESTIONNAIRE

Research questionnaire:

Name:	Surname:
School:	Date:
Teaching experience: _____ years	

1. With the onset of the COVID-19 pandemic, how did you prepare yourself for the closure of schools?

2. How did the school instruct you to proceed teaching during the lockdown?

3. What guidelines, if any, were you given to teach mathematics?

4. Whilst at home, in the lockdown, what contact did you have with your school and learners?

5. Did you arrange for learners to complete work at home in the form of providing work packs or sending homework home? If so, explain WhatsApp, MS Teams, Google Meet, Websites or any other? Please name \all that you used (even if limited) and how you used it.

6. Have you used communication tools or strategies during the pandemic such as WhatsApp, MS Teams, Google Meet, Websites or any other? Please name all that you used (even if limited) and how you used it.

7. Are you still using any of these communication tools in relation to supporting mathematics teaching and learning? Please say which you use and how you use them? (Example: WhatsApp as form of communication or MS Teams to send out missed work).

8. Please describe guidance (if any) from the Department of Education or your school on managing mathematics content coverage during the pandemic?

9. What additional support might you have wanted from the Department of Education, if any?

10. Did you make use of the websites, apps and other resources suggested by the Department of Education? If any, please state which ones.

11. How did you adapt your remote teaching strategies once learners started to return on a rotational basis?

12. How are you currently managing content coverage of the mathematics curriculum and have you made any adaptations to it?

13. Are there certain topics that you feel are no longer relevant (or not a priority) in a post-pandemic classroom? Please briefly state why and what content?

14. What support, if any, are you receiving now in terms of catching up lost teaching time?

15. Do you notice a significant difference in the learners' mathematical learning now than prior to the pandemic? Please explain.

16. How, if at all, have your teaching methods changes in the post-pandemic classroom?

Thank you for taking the time to fill out this questionnaire.

17. Would you be willing to participate in a follow-up interview?

Yes / No

18. If yes, please provide me with contact details on which I can contact you to arrange a time and date that suits you.

Email:

Cell phone number:

Your contact details will remain confidential.

APPENDIX 5: INTERVIEW SCHEDULE

1. When first hearing about the COVID-19 virus in South Africa, how did you think it would impact you on a professional level?
2. When schools were instructed to close in March 2020, did you instruct the learners to take any workbooks/resources home? Explain.
3. During the level 5 lockdown between march and April 2020 did you have any contact with the school or the learners/parents during this time? E.g., Via email/ WhatsApp/ phone calls etc. Explain
4. After April did your school provide you with any guideline before July 2020? Explain
5. What guidelines did you receive from the DBE/HoD/ Principals on how teaching should take place during the pandemic?
6. Did you teach mathematics remotely at all? Exp: by handing out workbooks, worksheets, WhatsApp, teams/ phone calls, SMS etc.?
7. How do you think the pandemic and possible remote learning impacted your learners in terms of their mathematics education?
8. Did you find ways to adapt to remote teaching either by yourself (initiative) or through support from the school?
9. Working and sharing struggles with fellow teachers, often gives insight into how teaching can be optimised. Did your fellow teachers collaborate with you at all on managing content coverage in mathematics?
10. Can you share any insights you developed on ways to support learners to continue their mathematics learning at home (during and post Covid)?
11. Did you make use of any technology when teaching mathematics during the pandemic? Exp: WhatsApp, Teams, Videos etc (and how)?
12. Are there any teaching strategies that you used during covid that you still use now? Exp: using videos as a way to introduce a topic?
13. What do you understand by/ or have been told about the adjusted mathematics curriculum and what that means for your teaching?
14. What are your thoughts on the adjusted mathematics curriculum (number sense reduced from 1000-800, exclusion of length and mass, reduced working with time)?
15. How did you find math adjustments compared to other subjects?
16. Are you managing to cover the reduced mathematics content?
17. Did you manage content coverage better/worse before the pandemic? Explain
18. Are learners benefitting from the adjusted curriculum? How/Why not?
19. The adjusted curriculum was made available from 2020-2023. Do you feel ready to return to a full curriculum in the next year? If not when - Explain
20. Do you think your learners would cope with a full curriculum in the next year? Or are there certain aspects of the curriculum that should still be left out? Explain
21. Your current grade 3 learners missed much teaching time in grade R in 2020 and grade 1 in 2021. Do you notice a significant difference in the learners' abilities now compared to the learners in grade 3 you taught before the pandemic? Explain
22. What would you require from the DBE to help you to cover the needed mathematics curriculum?
23. Any general feedback you think policy makers should know

    Thank you so much for your time….

APPENDIX 6: DOCUMENT ANALYSIS

https://d.docs.live.net/27bdd63f3fb1607a/Master/Document%20analysis%20-%20update%20current%20.xlsx

Name of the document	Author	Date	Source	Important parts	Themes identified	DBE instruction
2019 School Calender for Public Schools	DBE	11 January 2017	https://www.gov.za/sites/default/files/gcis_document/201711/41219gon1154.pdf	school calender 2019	school days	
GUIDELINES FOR DEVELOPMENT OF THE SCHOOL TIMETABLESREOPENING OF SCHOOLS COVID-19	DBE	11 June 2020	https://section27.org.za/wp-content/uploads/2020/05/guidelines-for-timetabling.pdf	Different models for rotation of learners during covid 19 when returning to school: platooning, alternating days per week or bi-weekly rotaitons, priority to gr. 12/7, foundation phase emphasis on literacy and numeracy	school rotation	models of rotation for larg schools that cannot adeı to social distancing withou rotation
National Education Policy Act: Amended 2020 School Calendar for Public Schools	DBE	11 June 2020	https://www.gov.za/documents/national-education-policy-act-amended-2020-school-calendar-public-schools-11-jun-2020-0000	Amended school calender - Total of 174 days	school days	revised school days
Disaster Management Act: Directions: Re-opening of schools and measures to address, prevent and combat the spread of Coronvirus COVID-19 in the Education Sector	DBE	23 June 2020	https://www.gov.za/documents/disaster-management-act-directions-issued-terms-regulation-4-3-regulations-made-under-act	gives online links to guidelines to maintiane hygiene , return to schools,schools need to meet hygiene requirements and have covid preventatvie measures in place, constant reporting of covid cases, failure to meet standards will results in schools being closed again, wehen tecahers/ staff is allowed on premesis, parents to	phased return of learners and regulations around the return and reoping of schools	reguationson when and how schools may reopen
National Education Policy Act: 2020 school calendar for public schools: Amended	DBE	11 August 2020	https://www.gov.za/documents/national-education-policy-act-2020-school-calendar-public-schools-amended-11-aug-2020-0000	Amended school calender - now total of 158 days, 16 days (for grade 12 and 7, grade 3 only started on	school days	revised school days
National Education Policy Act: 2021 School Calendar for public schools: Amendment	DBE	02 October 2020	https://www.gov.za/documents/national-education-policy-act-2021-school-calendar-public-schools-amendment-2-oct-2020	amended calender 2021 - 195 school days	school days	revised school days
National Education Policy Act: Latest Amended 2021 School Calendar for public schools	DBE	16 February 2021	https://www.gov.za/documents/national-education-policy-act-latest-amended-2021-school-calendar-public-schools-16-feb	Amended school calender 2021 - 192 school days, 3 days less	school days	revised school days
2022 SCHOOL CALENDAR	DBE	25 May 2021	https://www.education.gov.za/Portals/0/Documents/Publications/2022%20School%20Calendar%20Gazette.pdf	school calender 2022 - 199 school days	school days	school days
Minister Angie Motshekga on the return of schools to daily attendance	DBE	06 February 2022	https://www.gov.za/speeches/minister-angie-motshekga-return-schools-daily-attendance-6-feb-2022-0000	full time attendacne for learners from 7 February 2022	return of learners	
2023 School Calender	DBE	18 March 2022	https://www.education.gov.za/portals/0/documents/publications/2023%20School%20Calendar.pdf	school calender 2023 - 199 school days	school days	school days
Guidance for childcare facilities and schools on COVID-19	DBE	11 March 2020	https://www.gov.za/sites/default/files/gcis_documents/childcare.pdf	role of the school in terms of containing the spread of covid virus. Guidelines for principlas, teachers and admin staff. Includes action that needs to be taken when a case has been identified, suspected, or confirmed .	health and safety	Guidelines to contain spead of covid in schools
Disaster Management Act: Directions: Re-opening of schools under Coronavirus COVID-19 lockdown	DBE	29 May 2020	https://www.gov.za/sites/default/files/gcis_document/202005/43372gen302.pdf	dates of return for learners from 1 June 2020 (grade 3 - 6 July)		
Disaster Management Act: Directions: Re-opening of schools under Coronavirus COVID-19 lockdown: Amendment	DBE	01 June 2020	https://www.gov.za/sites/default/files/gcis_document/202006/43381gen304.pdf	dates of return for learners from 1 June 2020 (grade 3 - 6 July), issueing of permits for teachers and learners, HoD, May/June xams moved to Nov/Dec, health and safty regulations to be implemented, symptom screening, use of PPE, social distancing and timetable models.	timetable models (pg. 13) CAPS reviewed to accommodate lost teaching time	school that don't comply with directions will remain closed.
Disaster Management Act: Directions: Measures to address, prevent and combat the spread of Coronavirus COVID-19: Zero-rating of websites for Education and Health	DBE	05 June 2020	https://www.gov.za/documents/disaster-management-act-directions-measures-address-prevent-and-combat-spread-20	Application for zerp-rated websites and criteria to apply for zero-rated websites to use in DBE, DHET, DoH	Zero-rated websites	
RE-OPENING OF EARLY CHILDHOOD DEVELOPMENT PROGRAMMES	DBE	21 June 2020	https://www.gov.za/sites/default/files/gcis_documents/ecds-preparation.pdf	Circular regarding preparation to reopen ECD centres and self-assessment to establish readiness to open centre.	School readiness to reopen	assessment for readiness to reopen
Disaster Management Act: Directions: Measures to address, prevent and combat spread of Coronavirus COVID-19: Re-opening of schools under Alert Level 3	DBE	29 June 2020	https://www.gov.za/documents/disaster-management-act-directions-re-opening-schools-and-measures-address-prevent-and	Phased return of learners to school and planned return dates. (Grade 3 - 6 July)	school days	
Disaster Management Act: Re-opening of schools and measures to address, prevent and combat the spread of Coronavirus COVID-19: Amendment	DBE	07 July 2020	https://www.gov.za/documents/disaster-management-act-re-opening-schools-and-measures-address-prevent-and-combat-spread	Phased return of learners in 2020	dates for learners to return to school according to grades	Phased return after level lockdown
Disaster Management Act: Re-opening of schools and measures to address, prevent and combat the spread of Coronavirus COVID-19: Amendment	DBE	07 July 2020	https://www.gov.za/documents/disaster-management-act-re-opening-schools-and-measures-address-prevent-and-combat-spread	Amendment to the planned phased return of learners to school (Grade 3- 20 July)	return of learners	
Disaster Management Act: Directions: Measures to address, prevent and combat spread of Coronavirus COVID-19: Re-opening of schools under Alert Level 3: Amendment	DBE	2 Aug 2020	https://www.gov.za/documents/disaster-management-act-directions-measures-address-prevent-and-combat-spread-22	HoD must ensrue schools continue to conduct assessments of learners and provide feedback to learners/paretns. All school go on break form 27 July. Principlas and school managemnet stays at school. Feeding continues. Return of learners after planned break. All teachers to report for duty on 17 August and ensure learning material is distributed. Grade 3 learners to return on 24 August. With learners return - social distancing must be adhered to, schools with permits may continue deviated plan of learners return, officals are on duty even if school is on break, Principlas and management must work out own rotational plan of learners. Guidelines for parents who choose to not send learners back to school. APplication form for learners to be exempt from school	Guidelines for principals	
Disaster Management Act: Directions: Measures to address, prevent and combat spread of Coronavirus COVID-19: Re-opening of schools: Amendment: Comments invited	DBE	21 August 2020	https://www.gov.za/documents/disaster-management-act-directions-measures-address-prevent-and-combat-spread-25	Learners who don't return to school - make learning material available. Learners who do not returnt o school need to be formally expemted.	resources need to be made available	Parents need to registe rlearners for homeschooling. And teachers to make materia availbale for learners at home, DBE to provide teaching and learning materials, provide where possible devices for use
Disaster Management Act: Directions: Measures to address, prevent and combat the spread of Coronavirus COVID-19 relating to re-opening of schools: Amendment	DBE	21 Oct 2020	https://www.gov.za/documents/disaster-management-act-directions-re-opening-schools-under-coronavirus-covid-19-0	non-contact sport training, arts and culture events may resume without spectaros, guidelines for how many people may take part (50% capacity, 250 indoor, 500 outdoor). Records must be kept of all visiting learners and covid safety procedures adhered to.	health and safety	
Disaster Management Act: Directions: Measures to address, prevent and combat spread of Coronavirus COVID-19: Re-opening of schools for the 2021 Academic Year under Adjusted Alert Level 3	DBE	22 January 2021	https://www.gov.za/documents/disaster-management-act-directions-measures-address-prevent-and-combat-spread-38	arrengements for reopeing of schools in 2021. Educators 1 February and all learners 15 February. Independent schools to delay reopening for two weeks after 15 January, safety procedures still apply under lockdown level 3.	return of learners	
Disaster Management Act: Directions: Measures to address, prevent and combat spread of Coronavirus COVID-19: Re-opening of schools in 2021	DBE	12 Feb 2021	https://www.gov.za/documents/disaster-management-act-measures-address-prevent-and-combat-spread-coronavirus-covid-19-10	guidelines and direction for the return of learners to schools. Detailed regulations of health and safety and procedures to follow when a positive case has been identified. Monitoring of school learner attendance. Application for exemption of learners from attending contact school. Opening of hostels and sporting events, symptom screening, social distancing and timetable models with possible rotations, curriculum trimming and reorganising	health and safety	

Disaster Management Act: Directions: Measures to address, prevent and combat spread of Coronavirus COVID-19: Re-opening of schools	DBE	27 March 2021	https://www.gov.za/documents/disaster-management-act-directions-measures-address-prevent-and-combat-spread-40	amendments to school sport, physical education, extra-curricular activites, inter-school sport tournaments.	physical education ammendments	
Disaster Management Act: Directions: Re-opening of schools and measures to address, prevent and combat the spread of Coronvirus COVID-19 in the Education Sector	DBE	23 April 2021	https://www.gov.za/documents/disaster-management-act-directions-re-opening-schools-and-measures-address-prevent-and-0	amendments to previous document of directions for school sport and extra curricular activites.	further ammendments	
Disaster Management Act: Directions: Re-opening of schools and measures to address, prevent and combat the spread of Coronvirus COVID-19 in the Education Sector	DBE	28 May 2021	https://www.gov.za/documents/disaster-management-act-directions-re-opening-schools-and-measures-address-prevent-and-1	primary school learners full return to daily attendace from 26 July 2021 provided risk adjusted differentiated strategies are implemented, learning may take place outside of classroom, HoD must provide reasonable support to enable schools safely return to traditional timetable model, all contact sport is suspended,	health and safety for return of learners	
Disaster Management Act: Directions: Measures to prevent and combat the spread of Coronavirus COVID-19 in education: Amendments	DBE	29 Jun 2021	https://www.gov.za/documents/disaster-management-act-directions-measures-prevent-and-combat-spread-coronavirus-covid-2	All schools to close 31 June 2021, reopen on 19 July for all learners, adminnistrative and non-teaching staff 2 July, indepenadatn schools to close for two weeks from 30 June 2021, winter school for grade 11-12 to continue, traditional time table to continue from 26 July for grade R-7, teahcing to continue from 19 July untill full return on 26 July,.	return of learners	
Disaster Management Act: Directions: Measures to prevent and combat the spread of Coronavirus COVID-19 in education: Amendments	DBE	29 June 2021	https://www.gov.za/sites/default/files/gcis_document/202106/44779gen393.pdf	Amended school calender during covid	school days	dates for return for schools
Disaster Management Act: Directions: Re-opening of schools and measures to address, prevent and combat the spread of Coronavirus COVID-19 in the Education Sector: Amendmen	DBE	15 July 2021	https://www.gov.za/sites/default/files/gcis_document/202107/44858gen422.pdf	daily or weekly school rotational attendance form August 2021	rotation of learner attendance	dates for return for schools
Disaster Management Act: Directions: Re-opening of schools and measures to address, prevent and combat the spread of Coronavirus COVID-19 in the Education Sector: Amendment	DBE	1 Aug 2021	https://www.gov.za/documents/disaster-management-act-amendment-directions-regarding-closing-and-re-opening-schools-0	traditonal daily attendacenf or grade R-7 from 2 August 2021, Social distancing in primary school reduced to 1 meter not 1,5. principlas and HoD to inform district by August if they want to continue rotational method with reason for non-compliance, indoor activites no more than 50 and out door 100 for sporting activites, social distancing adhered to at all times for sporting events,	health and safety for return of learners	
Disaster Management Act: Directions to address, prevent and combat the spread of Coronavirus COVID-19: Amendment	DBE	10 December 2021	https://www.gov.za/sites/default/files/gcis_document/202112/45611gen707_0.pdf	marking of examination regulations	matirc forcused	
Disaster Management Act: Directions: Re-opening of schools and measures to address, prevent and combat the spread of Coronavirus COVID-19 in the Education Sector: Amendment	DBE	14 January 2022	https://www.gov.za/sites/default/files/gcis_document/202201/45753gen758.pdf	allowing spectaters at a sports event with no more than 50 % and 1,5 meters apart at school events	safety regulations	health and safety
Disaster Management Act: Directions: Full time return of learners to schools and measures to address, prevent and combat the spread of Coronavirus COVID-19 in the Education Sector	DBE	06 February 2022	https://www.gov.za/documents/disaster-management-act-directions-full-time-return-learners-schools-and-measures-address	full time return of all learners with no social distance form 7 February 2022, but still keeping to covid regulations of santising and regular handwashing	return of learners	removal of guideline sin schools
Curriculum and Assessment Policy Statement	DBE	03 July 1995	https://www.education.gov.za/Curriculum/CurriculumAssessmentPolicyStatements(CAPS)/CAPSFoundation.aspx	Caps documents updated 2016 for grade r-12 (National Curriculum Statement).	CAPS	
NATIONAL PROTOCOL FOR ASSESSMENT GRADES R – 12	DBE	28 December 2012	https://www.education.gov.za/Portals/0/Documents/Policies/NatProtAssess.pdf?ver=2015-02-03-154935-303	National protocoll for assessment grade r-12	assessments	
Mathematics Teacher toolkit: CAPS Planner, tracker and assessmnet resources	DBE	01 January 2019	https://nect.org.za/materials/maths/term-1/trackers/gr-3-term-1-2019-maths-tracker.pdf	Term 1 weekly mathematics planner for 2019	Term plans	
Grade 3 mathematics Lesson plans and assessments	DBE	01 April 2019	https://juffer.files.wordpress.com/2012/09/gplms-grade-3-term-2.pdf	Term 2 weekly mathematics plan for 2019	Term plans	
ATP 2020	DBE	01 June 2020	ATP 2020_national-revised-atps-grade-3-non-languages-1.pdf	Annual mathemtics teaching plan 2020	ATP 2020	
ATP 2021	DBE	01 February 2021	https://nect.org.za/materials/recovery-atps-trackers	Annual mathemtics teaching plan 2021	ATP 2021	
ATP 2022	DBE	01 December 2021	Maths Grade 3 Term 1 2022 Recovery ATP Tracker.pdf	Annual mathemtics teaching plan 2022	ATP 2022	
ATP 2023	DBE	22 December 2022	ATP 2023-24 Gr 3 Mathematics final.pdf (education.gov.za)	Annual mathemtics teaching plan 2023	ATP 2023	
Foundation phase mathematics lesson plans 2023	DBE	26 January 2023	https://caps123.co.za/foundation-phase-mathematics-lesson-plans-2023/#google_vignette	Term 1-4 mathematics plan for 2023 grade 3 (1-3)	Term plans	
Minumum core content and skills grade r-3 mathematics	DBE	20 August 2020	https://wcedeportal.co.za/eresource/144511	Revised Annual teaching Plans - Purpose and foundation subjects Grade r-3	ATP	
Implementaiton of ATPs (Foundationals - Core Content & skills)	DBE	05 July 2020	https://wcedeportal.co.za/eresource/145006	Purpose and guidelines for implementing ATPs:	Implementation of ATP	
Teacher guidelines for the implementation of the revised ATPs (Gr. R-3) Mathematics	DBE	06 July 2020	https://wcedeportal.co.za/eresource/142626	Refelct, analyse, plan, teach, assess - guideines for implementation of the revised ATP (GR. R-3) mathematics.	Implementation of ATP	
Recovery plans 2021 and 2023/2024	DBE	n.d	https://wcedeportal.co.za/teacher_categories_page/67156/Foundation/201/56531/Mathematics%20%3A%20Grade%203/Recovery?shs_term_node_tid_depth=102956	Revised Annual teaching Plans - Purpose and foundation subjects Grade r-3	ATP	
List of Grade 3 mathematicsc learnring activites and materials	DBE	07 March 2022	https://mycourses.co.za/grade-3-mathematics-learning-activities-and-materials-for-caps/	2019 Term 1, 2018 Term 2, lockdown worksheets	Resources given by DBE	
Release of the curriculum recovery annual teaching plans for 2021	DBE	11 December 2020	https://www.education.gov.za/Portals/0/Documents/Recovery%20plan%20page/2021%20ATPs/Circular%20S13%20_%20CURRICULUM%20RECOVERY%20_%20ATPs%20%20N%202021%20-%20final.pdf?ver=2021-01-12-133127-147	Relsease of the curriculum recovery annual teaching plan for 2021. Multi - year recovery atps developed to consider learning loss oin 2020, opportunites to strengthen pre-knowledge, consolidation and revision, assessment for learning to address learning loss, maintain suse of current leaning and teaching support material and resources, alignment of caps for all subjects, amended assessment requirements for gade 4-12,	ATP	
LEARNING RECOVERY PROGRAMME GUIDELINES FOR CIRCUIT MANAGERS	DBE	24 April 2023	https://www.education.gov.za/Portals/0/Documents/Publications/LRP%20Guidelines/Circuit%20Manager%20Guidelines.pdf?ver=2023-04-24-155306-000	Learning recovery programm - Ways to recover lost eachig time between 2020-2021	Learning recovery programm	
DISTRIBUTION OF THE TEACHER GUIDELINES FOR THE IMPLEMENTATION OF ANNUAL TEACHING PLANS (ATPs) AND THE MINIMUM CORE CONTENT AND SKILLS PER SUBJECT AND PER GRADE	DBE	09 July 2020	https://naptosa.org.za/wp-content/uploads/2022/03/Circular-53-of-2020-Distribution-of-Teacher-Guidelines.pdf	Guidelines for teacher sto implement the ATPs	documents that will be sent to teachers	Revised ATP, instructions for teachers and poweerpoint are sent to principals.
Teacher Guidelines for Implementing Revised Annual Teaching Plans (ATPs) TEACHER VERSION1	DEB via NEPTOSA	06 July 2023	https://naptosa.org.za/wp-content/uploads/2022/03/Annexure-A-Teacher-guidelines-for-the-implementation-of-the-revised-ATPs.pdf	Challenges, guiding principles, guidelines for teachers, integrationg home and school learning	emerging challenges with implementing the ATPs	integration of home and school learning, supportin g learners at home - worksheets, texbooks, online material, practical work that needs to be sent home
South African Schools Act: Amendment of regulations: National Curriculum Statement Grades R-12: Comments invited	DBE	11 September 2020	https://www.gov.za/documents/south-african-schools-act-amendment-regulations-national-curriculum-statement-grades-r-12	Life sciences physical sport amendments	ATP - Life sciences	no physical exercise
South African Schools Act: Regulations: National Curriculum Statement Grades R-12	DBE	05 February 2021	https://www.gov.za/documents/south-african-schools-act-regulations-national-curriculum-statement-grades-r-12-5-feb-2021	Sports and exercise must offer physical sciences or life sciences	Introduction of new subjects	replacement of subjects

APPENDIX 7: ATP ANALYSIS

https://d.docs.live.net/27bdd63f3fb1607a/Master/CAPS%20-%20ATP%202019-2023%20for%20analysis.xlsx

Mathematics Content	School days per Term	CAPS	School days per Term	2020: T1 not included, T2 5 day, T3 35 days, T4 53 days =93 days	School days per Term	2021	School days per Term	2022	School days per Term	2023
Link to documents (document trail)		C:\Users\Inge\OneDrive\Master\Document analysis\ATPs\CAPS MATHS ENGLISH GR 1-3 FS.pdf		C:\Users\Inge\OneDrive\Master\ATPs\ATP 2020_national-revised-atps-grade-3-non-languages-1.pdf		C:\Users\Inge\OneDrive\Master\ATPs\2021 Mathematics ATP Grade 3 Term 1.pdf		C:\Users\Inge\OneDrive\Master\ATPs\Maths Grade 3 Term 1 2022 Recovery ATP Tracker.pdf		C:\Users\Inge\OneDrive\Master\ATPs\2023 Grade 1 - 3 Mathematics FP ATP mediation.pptx
		C:\Users\Inge\OneDrive\Master\ATPs\gplms-grade-3-term-2 2019.pdf				C:\Users\Inge\OneDrive\Master\ATPs\2021 ATP Mathematics Grade 3 Term 2_ATP.pdf		C:\Users\Inge\OneDrive\Master\ATPs\Maths Recovery ATP - Grade 3, Term 2, 2021 - 2023.pdf		C:\Users\Inge\OneDrive\Master\ATPs\ATP 2023-24 Gr 3 Mathematics final.pdf
	C:\Users\Inge\OneDrive\Master\Document analysis\2019 school days.pdf	C:\Users\Inge\OneDrive\Master\ATPs\gr-3-term-1-2019-maths-tracker.pdf		C:\Users\Inge\OneDrive\Master\ATPs\ATP 2020_national-phase-content-plans-grade-1-3-mathematics-1 (1).pdf		C:\Users\Inge\OneDrive\Master\ATPs\2021 ATP Mathematics English Grade 3 Term 3.pdf		C:\Users\Inge\OneDrive\Master\ATPs\Gr 3 Term 1 2022 HL English Recovery ATP Tracker.pdf		C:\Users\Inge\OneDrive\Master\ATPs\2023 Grade 1 - 3 Mathematics FP ATP mediation.pptx
				C:\Users\Inge\OneDrive\Master\ATPs\2023 Grade 1 - 3 Mathematics FP ATP mediation.pptx		C:\Users\Inge\OneDrive\Master\ATPs\2021 ATP Mathematics English		C:\Users\Inge\OneDrive\Master\ATPs\Mathematics Tracker (ATP) Grade 3, Term 4 of 2021.pdf		
1.1 count objects	total 203		total 158 (actual - 128)	PP: Number range reduced to 800	total 198		total 207		total 207	
	1 - 48	group to at least objects to estimate and count reliably/ estimate	1 - 46		1- 50	200	1 - 47	300	1 - 53	500
	2- 54	group to at least 500	2 -35 (actual 5)		2 - 50	500	2 -59	500	2 - 53	500
	3 - 54	group to 700	3 - 45	400	3 - 50	700	3 - 54	700	3 - 54	700
	4 - 47	count to 1000 (grouping is encouraged)	4 - 32	800	4 - 48	999	4 - 47	999	4 -47	999
1.2 Count forward and backwards				Number range reduced to 800						
		to 500 (in 100s)				to 200	1 - 47		1 - 53	500 (in 50,100 to 1000)
		to 500 (1,10,5,2,3,4,50,100 to 1000)		200		to 500	2 -59	500 (in 50)	2 - 53	500
		to 700 (1,10,2,3,4,-20,25,50,100- to 1000)		400		700	3 - 54		3 - 54	800
		to 1000 (1,10,5,2,3,4,20,25,50,100)		800		1000	4 - 47	count in 4s (grid of 100) to 900	4 -47	1000
1.3 Number symbols and number names				Number range reduced to: •read number symbols 1 to 800 •write number symbols 1 to 800 •read number names 1 to 800 •write number names 1 to 800						
	1 - 48	•recognise, identify and read number symbols 0 - 500 • Write number symbols 0 - 500 • Recognise, identify and reads number names 0 - 250 • Write number names 0 - 500	1 - 46		1- 50	read and write number symbols and number names to 200	1 - 47	300	1 - 53	recognise, identify, read symbols to 500, write number symbols and number names to 250
	2- 54	recognise, identify and read 1-1000, write symbols 0-1000, read number names 0-250, write number names 0 -250	2 -35 (actual 5)	read number symbole 1-500, write number symbole 1-500, read number names 1-250, write names 1-200	2 - 50	read and write number symbols and number names to 500	2 -59	500	2 - 53	recognise, identify, read symbols to 500, write number symbols and number names to 250
	3 - 54	same as T2, read number names to 500, write number names to 500	3 - 45	read 1-800, write 1-800, read names 1-500, write names 1-400	3 - 50	read and write number symbols and number names to 700	3 - 54	700	3 - 54	recognise, identify, read symbols to 1000, write number symbols and number names to 500
	4 - 47	all to 1000	4 - 32	all to 800	4 - 48	read and write number symbols and number names to 1000	4 - 47	999	4 -47	1000
1.4 Describe, compare and order numbers				Number range reduced from 999 to 800						
	1 - 48	describe, compare and order numbers to 99	1 - 46		1- 50	to 200	1 - 47	back to 2019	1 - 53	back to 2019
	2- 54	order, compare to 500 use ordinal numbers to show order, place, position	2 -35 (actual 5)		2 - 50	to 500	2 -59		2 - 53	
	3 - 54	same as T2	3 - 45	number range 1-400	3 - 50	to 700	3 - 54		3 - 54	
	4 - 47	to 999	4 - 32	1-800	4 - 48	to 1000	4 - 47		4 -47	
1. 5 Place value				Number range reduced from 999 to 800						
	1 - 48	recognise the place value of numbers to 99	1 - 46		1- 50	HTO	1 - 47		1 - 53	
	2- 54	recognise place vlaue to 500	2 -35 (actual 5)		2 - 50	HTO	2 -59		2 - 53	
	3 - 54	recognise place value to 750	3 - 45	to 400	3 - 50	HTO up to 700	3 - 54		3 - 54	
	4 - 47	understand place value (0 as place holder)	4 - 32	to 800	4 - 48	HTO up to 1000	4 - 47		4 -47	
1.6 Problem solving techniques	1 - 48	Use the following techniques when solving problems: • building up and breaking down numbers • doubling and halving • number lines	1 - 46		1- 50		1 - 47		1 - 53	
	2- 54	same as T1	2 -35 (actual 5)	Use the following techniques when solving problems: • building up and breaking down numbers • doubling and halving • number lines	2 - 50		2 -59		2 - 53	
	3 - 54	same as T1	3 - 45	same as T2, add rounding off in tens	3 - 50		3 - 54		3 - 54	
	4 - 47	same as T1	4 - 32	same as T3, and explain solutions	4 - 48		4 - 47		4 -47	
1.7 Addition and subtraction				Number range reduced from 999 to 800						
	1 - 48	Solve word problems in context and explain own solution to problems involving addition, subtraction leading answers up to 99.	1 - 46		1- 50	in context to 100	1 - 47	to 99	1 - 53	to 99
	2- 54	word problems to 400	2 -35 (actual 5)	in context to 200	2 - 50	in context and context free to 500	2 -59	to 500	2 - 53	to 400
	3 - 54	in context to 800	3 - 45	in context to 400	3 - 50	in context and context free 700	3 - 54	to 700	3 - 54	to 800
	4 - 47	in context to 999	4 - 32	in context to 800	4 - 48	in context and context free to 1000	4 - 47	to 999	4 -47	to 999

illogical

no data

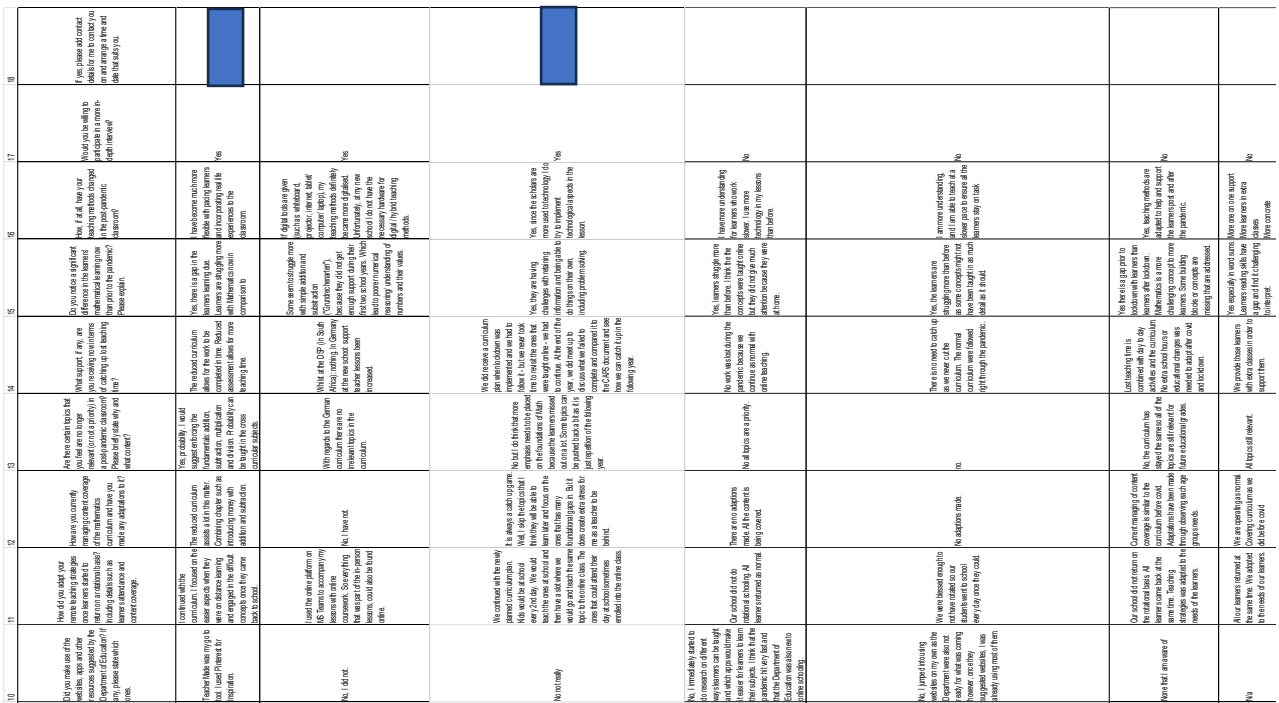
	4 - 47	in context to 999	4 - 32	in context to 800	4 - 48	in context and context free to 1000	4 - 47	to 999	4 -47	to 999
1.8 Repeat addition leadign to multiplication	1 - 48	up to 50 in context	1 - 46		1- 50	to 50 in context	1 - 47	up to 50	1 - 53	up to 50
	2- 54	up tp 75 in context	2 -35 (actual 5)		2 - 50	to 50 in context	2 -59	up to 50	2 - 53	up to 50
	3 - 54	up to 75 in context	3 - 45	up to 75	3 - 50	to 70 in context	3 - 54	up to 100	3 - 54	up to 100
	4 - 47	up to 99 in context	4 - 32	up to 100	4 - 48	to 100 in context	4 - 47	up to 100	4 -47	up to 100
1.9 Grouping and sharing leading to division	1 - 48	up to 50 may include remainder	1 - 46		1- 50	up to 50 in context	1 - 47	up to 50		up to 50
	2- 54	grouping up to 75 may include remainder	2 -35 (actual 5)		2 - 50	up to 75 with remainder	2 -59	up to 50		up to 50
	3 - 54	up to 150 may include remainder	3 - 45	up to 75 may include remainder	3 - 50	up to 100 with remainder	3 - 54	up to 100		up to 100
	4 - 47	up to 200 may include remainder	4 - 32	up to 100 may include remainder	4 - 48	up to 100 with remainder	4 - 47	up to 100		up to 100
1.10 sharing leading to fractions	1 - 48	equal sharing leading to unitary and non-unitary fractions	1 - 46		1- 50	sharing leading to fraction	1 - 47		1 - 53	
	2- 54	same as T1	2 -35 (actual 5)		2 - 50	sharing leading to fraction	2 -59		2 - 53	
	3 - 54	same as T1	3 - 45	equal sharing of unitary and non-unitary fractions	3 - 50	sharing leading to fraction	3 - 54		3 - 54	
	4 - 47	same as T1	4 - 32	same as T3	4 - 48	sharing leading to fraction	4 - 47		4 -47	
				5 Cents coin excluded						
1. 11 Money	1 - 48	recognise and identify all SA notes and coins, solve money problems involving totals and change in R and ct	1 - 46		1- 50	solve money problems involving totals and change in rand and cent up to R100	1 - 47		1 - 53	
	2- 54	same as T1	2 -35 (actual 5)		2 - 50	solve money problems involving totals and change in rand and cent (money problems)	2 -59		2 - 53	
	3 - 54	same as T1, convert between rand and cent	3 - 45	recognise and identify all SA notes and coins, solve money problems involving totals and change in R and ct	3 - 50	money problems involving total and change, converting between Rand and ct	3 - 54		3 - 54	
	4 - 47	same as T3	4 - 32	same as T3	4 - 48	money problems involving total and change, converting between Rand and ct	4 - 47		4 -47	
1.12 Techniques (methods and strategies)	1 - 48	se the following techniques when performing calculations: • building up and breaking down numbers • doubling and halving • number lines	1 - 46		1- 50		1 - 47		1 - 53	
	2- 54	same as T1	2 -35 (actual 5)	se the following techniques when performing calculations: • building up and breaking down numbers • doubling and halving • number lines	2 - 50		2 -59		2 - 53	
	3 - 54	same as T1	3 - 45	same as T2, add rounding off in tens	3 - 50		3 - 54		3 - 54	
	4 - 47	same as T1	4 - 32	same as T3	4 - 48		4 - 47		4 -47	
1.13 Addition and subtraction	1 - 48	Add up to 99 • Subtract from 99 • Use appropriate symbols (+, −, =, ☐) • Practise number bonds to 20	1 - 46		1- 50	up to 100, bonds 20	1 - 47		1 - 53	
	2- 54	add/ subtract range unspecified, number bonds to 30	2 -35 (actual 5)	add to 200, bonds to 20	2 - 50	uo to 500, bonds to 20	2 -59		2 - 53	
	3 - 54	up to 800, number bond up to 30	3 - 45	add to 400, bonds 30	3 - 50	up to 700, bonds to 30	3 - 54		3 - 54	
	4 - 47	up to 999, number bond 30	4 - 32	add 800, bonds 30	4 - 48	up to 1000, bonds 30	4 - 47		4 -47	
1.14 Repeated addition leading to multiplication	1 - 48	Multiply numbers 1 to 10 by 1,2,3,4,5 • Use appropriate symbols (x, −, =, ☐)	1 - 46		1- 50	up to 50	1 - 47		1 - 53	
	2- 54	multiply to total of 50	2 -35 (actual 5)		2 - 50	up to 50	2 -59		2 - 53	
	3 - 54	2,3,4,5,10 to 99	3 - 45	multiply numbers 2,3,4,5,10 to 50	3 - 50	up to 70	3 - 54		3 - 54	
	4 - 47	1-10 by 1,2,3,4,5,10	4 - 32	multiply numbers 2,3,4,5,10 to 100	4 - 48	up to 100 (1-9 times table)	4 - 47		4 -47	
1.15 Division	1 - 48	Divide numbers to by (unspecified) • Use appropriate symbols (÷,−, =)	1 - 46		1- 50	up to 50	1 - 47		1 - 53	
	2- 54	divide number to 50 by 2,4,5,10,4	2 -35 (actual 5)		2 - 50	up to 75 with remainder	2 -59		2 - 53	
	3 - 54	divide number to 99 by 2,4,5,10,4	3 - 45	divide 50 by 2,4,5,10,3	3 - 50	up to 75	3 - 54		3 - 54	
	4 - 47	same as T3	4 - 32	divide 99 by 2,3,4,5,10	4 - 48	up to 100	4 - 47		4 -47	
1.16 Mental Mathematics	1 - 48	Number concept: Range 200, rapid recall add/sub to 20 and in mulitples of 10, mental stragies eg. Number line, double, build up and break down, relationship in addition and subtraction	1 - 46	integrated across all topics	1- 50	rapid recall add, sub to 20	1 - 47		1 - 53	
	2- 54	range 500	2 -35 (actual 5)		2 - 50	rapid recall add, sub facts to 20	2 -59		2 - 53	
	3 - 54	range 700, know more/less,	3 - 45		3 - 50		3 - 54		3 - 54	
	4 - 47	range 999	4 - 32		4 - 48		4 - 47		4 -47	
1.17 Fractions	1 - 48	use and name fractions in context, recognise in diagrammatic from, recognise two halves make one, write fractions as 1 half	1 - 46		1- 50	sharing leading to fractions	1 - 47	1/2,1/4,3/4/2/5, diagramatic	1 - 53	1/2,1/4,3/4/2/5, diagramatic
	2- 54	learn names of fraction parts,	2 -35 (actual 5)		2 - 50	sharing leading to fractions	2 -59	sharing leading to fractions	2 - 53	1/2,1/4,3/4/2/5, diagramatic
	3 - 54	same as T1	3 - 45	use and name fractions in context, recognise in diagrammatic from, recognise two halves make one, write fractions as 1 half	3 - 50	sharing leading to fractions	3 - 54	sharing leading to fractions	3 - 54	1/2, 1/4,1/3,1/5,1/6,/1/8, 3/4,2/5,2/4=1/2,4/4 =1
	4 - 47	same as T1, (halves, quarters, thirds, firths, sixth)	4 - 32	same as T3	4 - 48	sharing leading to fractions	4 - 47	sharing leading to fractions	4 -47	1/2, 1/4,1/3,1/5,1/6,/1/8, 3/4,2/5,2/4=1/2,4/4 =1
	1 - 48	copy, extend, describe, create own patterns	1 - 46		1- 50		1 - 47		1 - 53	

2.1 Geometric patterns	**1 - 48**	copy, extend, describe, create own patterns	**1 - 46**		**1- 50**		**1 - 47**		**1 - 53**	
	2- 54	same as T1	**2 -35 (actual 5)**		**2 - 50**	geometirc patterns integrated with 3D objects	**2 -59**		**2 - 53**	
	3 - 54	same as T1	**3 - 45**	copy, extend, describe, create own patterns	**3 - 50**	geometric patterns integraded with 2D	**3 - 54**		**3 - 54**	
	4 - 47	identify, describe in nature, everyday life, culture	**4 - 32**	identify, describe in nature, everyday life, culture	**4 - 48**		**4 - 47**		**4 -47**	
2.2 Number patterns				Number range reduced from 1000 to 800						
	1 - 48	copy, extend, descibe number sequences to 100	**1 - 46**		**1- 50**		**1 - 47**		**1 - 53**	
	2- 54	number sequence to 150	**2 -35 (actual 5)**	copy, extend, descibe number sequences to 200	**2 - 50**	to atleast 500	**2 -59**		**2 - 53**	
	3 - 54	number sequence to 180	**3 - 45**	copy, extend, descibe number sequences to 400, create own	**3 - 50**	integrated into counting to 700	**3 - 54**		**3 - 54**	
	4 - 47	number sequence to 1000, create and describe own	**4 - 32**	copy, extend, descibe number sequences to 800, create own	**4 - 48**	integrated into counting to 1000	**4 - 47**		**4 -47**	
3.1 Position, orientation and views										
	1 - 48	/	**1 - 46**		**1- 50**		**1 - 47**		**1 - 53**	
	2- 54	position/views: match views of objects, position/direction: follow direction to move around the classroom	**2 -35 (actual 5)**	can be integrated in with positions in language and life skills	**2 - 50**		**2 -59**		**2 - 53**	
	3 - 54	same as T2, find objects on maps	**3 - 45**		**3 - 50**	on an informal map	**3 - 54**		**3 - 54**	
	4 - 47		**4 - 32**		**4 - 48**	position, orientationa nd views	**4 - 47**		**4 -47**	
3.2 3-D objects										
	1 - 48	/	**1 - 46**		**1- 50**	3D objects	**1 - 47**		**1 - 53**	3D objects
	2- 54	recognise and name 3D objects (spheres, prism, cylinders), features of objects	**2 -35 (actual 5)**		**2 - 50**		**2 -59**	3D objects	**2 - 53**	
	3 - 54	same a T2, (add cones, pyramids)	**3 - 45**	recognise and name 3D objects (spheres, prism, cylinders,cones,pyramids), features of objects 2D shapes	**3 - 50**		**3 - 54**		**3 - 54**	
	4 - 47	same as T3	**4 - 32**		**4 - 48**		**4 - 47**		**4 -47**	
3.3 2-D shapes										
	1 - 48	rangeof shapes and features of shapes: cirlce, triangle, square, rectanlges.	**1 - 46**		**1- 50**		**1 - 47**	2D shapes	**1 - 53**	
	2- 54	/	**2 -35 (actual 5)**		**2 - 50**	2D shapes	**2 -59**		**2 - 53**	2D shapes
	3 - 54	descirbe, sort, compare (shape, straight side, round side), draw	**3 - 45**		**3 - 50**		**3 - 54**		**3 - 54**	
	4 - 47		**4 - 32**	rangeof shapes and features of shapes: cirlce, triangle, square, rectanlges, compare in terms of shape,straight and round sides)	**4 - 48**		**4 - 47**		**4 -47**	
3.4 Symmetry										
	1 - 48	/	**1 - 46**		**1- 50**		**1 - 47**	symmetry	**1 - 53**	
	2- 54	determine line of symmetry by paper folding/reflection	**2 -35 (actual 5)**	determine line of symmetry by paper folding/reflection	**2 - 50**		**2 -59**		**2 - 53**	symmetry
	3 - 54		**3 - 45**		**3 - 50**	symmetry	**3 - 54**		**3 - 54**	
	4 - 47	recognise and draw line of symmetry in 2D geometrical and non-geometrical shapes	**4 - 32**	recognise and draw line of symmetry in 2D geometrical and non-geometrical shapes	**4 - 48**		**4 - 47**		**4 -47**	
4.1 Time										
	1 - 48	tell time (in 12 hour- hour, half, quarter, minutes), read date and calander, place birthdays, analogue and digital	**1 - 46**		**1- 50**	time	**1 - 47**	time	**1 - 53**	
	2- 54	same as T1 and calculate length of time and passing of time	**2 -35 (actual 5)**	read date on calenders	**2 - 50**		**2 -59**	time	**2 - 53**	same as 2019
	3 - 54	same as T2	**3 - 45**	tell time (in 12 hour- hour, half, quarter, minutes), read date and calander, place birthdays, analogue and digital , calculate length of time	**3 - 50**		**3 - 54**		**3 - 54**	
	4 - 47	same as T2	**4 - 32**	same as T3	**4 - 48**		**4 - 47**		**4 -47**	
4.2 Length										
	1 - 48		**1 - 46**				**1 - 47**		**1 - 53**	informal measurement (estimate, compare - hand, pencil)/ formal measuring (estimate, measure, order and record measurement)
	2- 54	informal measurement (estimate, compare - hand, pencil)/ formal measuring (estimate, measure, order and record measurement)	**2 -35 (actual 5)**				**2 -59**		**2 - 53**	
	3 - 54	formal measurement - record length in cm	**3 - 45**			m/cm	**3 - 54**		**3 - 54**	
	4 - 47	in independent time	**4 - 32**				**4 - 47**		**4 -47**	

	1 - 48		1 - 46				1 - 47	Informal (estimate, compare - blocks/bricks)/ formal (compare, order and record mass of packcages)	1 - 53	Informal (estimate, compare - blocks/bricks)/ formal (compare, order and record mass of packcages)
4.3 Mass	2- 54	Informal (estimate, compare - blocks/bricks)/ formal (compare, order and record mass of packcages)	2 -35 (actual 5)			mass kg/g	2 -59		2 - 53	
	3 - 54	in context for solving problems	3 - 45				3 - 54		3 - 54	
	4 - 47	collect pictures of products with mass, of mass	4 - 32				4 - 47		4 -47	Informal (estimate, compare - blocks/bricks)/ formal (compare, order and record mass of packcages)
	1 - 48	informal measuring (estimate, compare,order etc), formal measurement (use bottles/jugs), record, order, compare comercial packages (2 l milk, 1l cool drink)	1 - 46		1- 50		1 - 47		1 - 53	
	2- 54	in context for solving problems and calculations, ml and l	2 -35 (actual 5)		2 - 50		2 -59		2 - 53	
4.4 Capacity/ Volume	3 - 54	in context for solving problems and calculations	3 - 45	informal measuring (estimate, compare,order etc), formal measurement (use bottles/jugs), record, order, compare comercial packages (2 l milk, 1l cool drink)	3 - 50		3 - 54		3 - 54	informal measuring (estimate, compare,order etc), formal measurement (use bottles/jugs), record, order,
	4 - 47	collect pictures of products with volume, of volume	4 - 32	in context for solving problems and calculations, no conversion required	4 - 48	ml/l	4 - 47	informal measuring (estimate, compare,order etc), formal measurement (use bottles/jugs), record, order, compare comercial packages (2 l milk, 1l cool drink)	4 -47	in context for solving problems and calculations
	1 - 48		1 - 46		1- 50		1 - 47		1 - 53	
4.5 Perimeter	2- 54		2 -35 (actual 5)		2 - 50		2 -59		2 - 53	
	3 - 54	investigate distance around 2D shapes and 3D objects using string	3 - 45		3 - 50	perimeter	3 - 54		3 - 54	
	4 - 47		4 - 32		4 - 48		4 - 47		4 -47	
	1 - 48		1 - 46		1- 50		1 - 47			
4.6 Area	2- 54		2 -35 (actual 5)		2 - 50		2 -59			
	3 - 54		3 - 45		3 - 50		3 - 54			
	4 - 47	invesitagte using tiling	4 - 32		4 - 48	area	4 - 47			
5.1 Collect and sort objects										
5.2 Represent sorted collection of objects										
5.3 Discuss and report on sorted collection of objects										
	1 - 48	collect data about class/school,	1 - 46		1- 50		1 - 47		1 - 53	
5.4 Collect and organise data	2- 54		2 -35 (actual 5)		2 - 50		2 -59	collect data about class/school,	2 - 53	collect data about class/school,
	3 - 54	collect datat about class/school to answer questions	3 - 45	reorganise data provided	3 - 50		3 - 54		3 - 54	collect data about class/school,
	4 - 47	organise date in list, tally, tables	4 - 32		4 - 48		4 - 47		4 -47	
	1 - 48	in table/ bar grpah	1 - 46		1- 50	tally, table, bar graph	1 - 47	tally, table, bar graph	1 - 53	tally, table, bar graph
5.5 Represent data	2- 54		2 -35 (actual 5)		2 - 50	integrated into other content areas	2 -59	tally, table, bar graph	2 - 53	tally, table, bar graph
	3 - 54	data bar	3 - 45	bar graph	3 - 50	integrated into other content areas	3 - 54		3 - 54	tally, table, bar graph
	4 - 47	pictograph, bar graph	4 - 32		4 - 48	integrated into other content areas	4 - 47		4 -47	
	1 - 48	answer questions about bar	1 - 46		1- 50		1 - 47		1 - 53	
5.6 Analyse and interpret data	2- 54	analyse data provided	2 -35 (actual 5)		2 - 50		2 -59		2 - 53	analyse data provided
	3 - 54	answer questions about bar	3 - 45		3 - 50		3 - 54		3 - 54	analyse data provided
	4 - 47	pictograph, bar graph	4 - 32	pictograph (1-1 correspondance), bar graph	4 - 48		4 - 47		4 -47	analyse data provided

APPENDIX 8: QUESTIONNAIRE RESPONSE

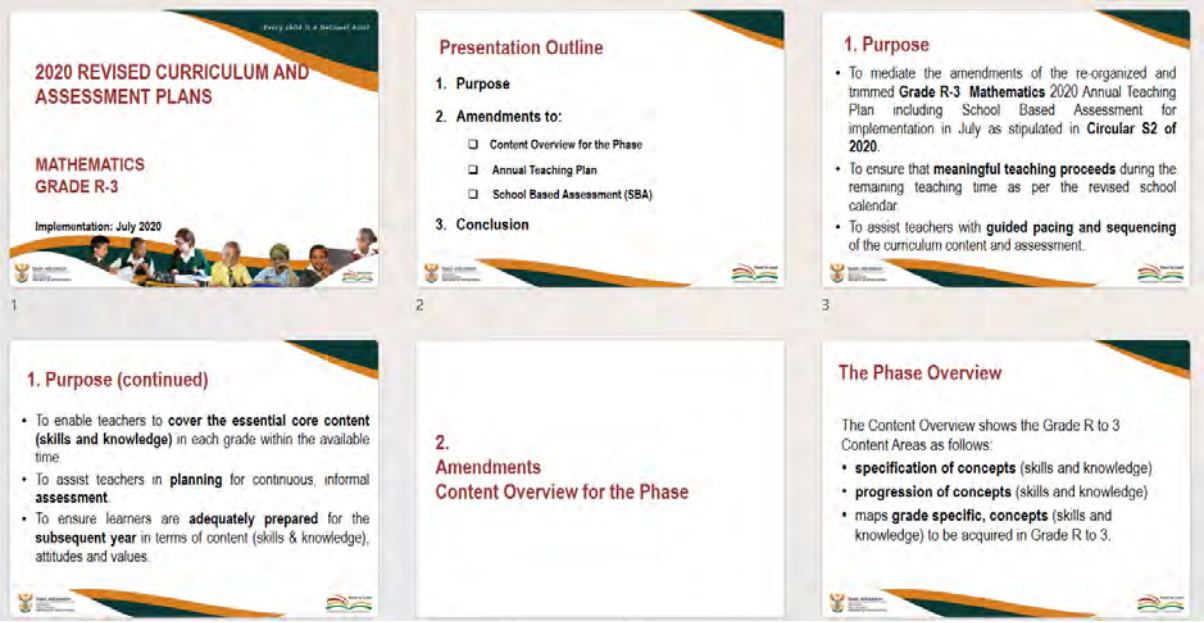
https://d.docs.live.net/27bdd63f3fb1607a/Master/Questionnaire%20(Responses).xlsx

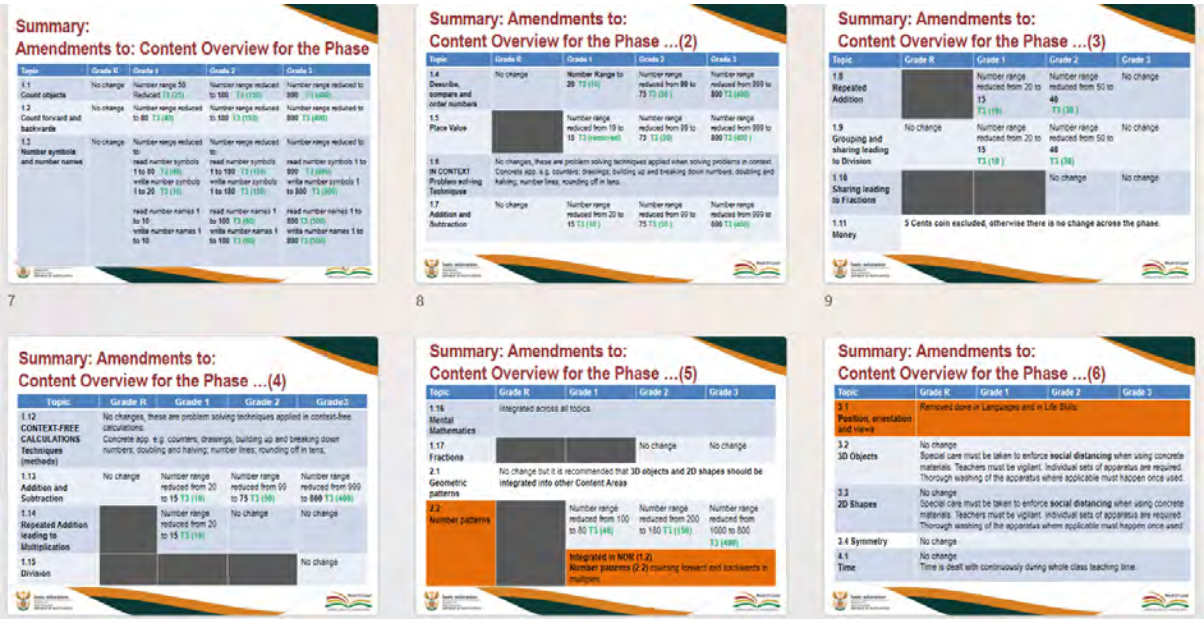


T8 - Q5	Yes		4	We immediately started to make weekly plans that the parents can easily follow with their children.	We started with online teaching through MS Teams	We made videos with powerpoint to teach the children the necessary principles they need to know.	Through MS Teams and WhatsApp	Yes MS Teams we sent the weekly plan to each child with videos to guide them. WhatsApp to reinforce with children if they did not understand.	WhatsApp and MS Teams to guide them on the right path.	WhatsApp to explain the concepts even more.	The department sent out a new ATP plan to cover with the children. They left out some of the concepts to make it less.	Na	Na	I continue using the videos that we made in Covid times	Sometimes I feel pressed with time and don't give enough time on certain concepts.	Na	Na	I started teaching in 2020	Na	No		
T9 - Q5	Yes		15	We prepared by turning everything digital. For example MS Teams and videographer to help capture lessons and send it out via MS Teams and PowerPoint.	As per usual but digitally, making worksheets, marking online.	We used mathematical concepts but simplified them on a PowerPoint then used our previous teaching experience to teach it online.	No contact in person all via WhatsApp and email.	Everything (worksheets, homework etc) uploaded to MS Teams and then they can access the work there (PowerPoints) to explain the worksheets and have them complete it.	Grade 3 teachers had a WhatsApp group. The parents with the teacher had a WhatsApp group and the school used D6 communicator.	The current learners have access to MS Teams and we still use old PowerPoints in the classroom now when teaching.	We received an adjusted CAPS document from ATP. We then just followed ATPs.	The adjusted CAPS document was sufficient.	Yes, six bricks.	More practical work in Math and spelling and phonics in language.	The curriculum is followed the same as always the only thing that changed was that we had PowerPoints that we can use that came in handy.	Post pandemic the life skills topic about hygiene and masks was no longer relevant.	We have extra classes to help learners who might struggle.	I have noticed a bettering in mathematics but a struggle in their reading especially when reading instructions.	We incorporated PowerPoint and have more materials for example: fractions, clocks and unifix blocks.	No		
T10 - Q5	Yes		6	All books, taptop and planning was packed to go home with us.	Online guided teaching.	We made presentations and videos to cover all the new work. This was sent to parents on a weekly basis.	Zoom, whatsapp with parents.	Arrangements to pick up books from school was made. WhatsApp group - to communicate every weeks work. Zoom - to see how everyone was g. Email - all enquiries Presentations/videos/photos. New work, feedback on activities. Ms Teams - meetings and training.	WhatApp Zoom	Whatsapp - communicate important information to parents. Email=other formal communication	The curriculum was made shorter. Implemented by our grade 3 group via the Grade leader.	None.	No.	Work was still given weekly. Learners would attend class every other day and work at home on the other day. Attendance was not good. Some learners had to isolate. We covered the required math work.	This years learners are doing well. Only adaptions are for learers whom require extra time due to learing barriers.	Some content could be improved to move back to more basic but effective math work.	This is not necessary with the current grade 3 group.	Not with the current group.	The presentations and videos can be used in class. Practical work stays important.	No		
T11 - Q5	Yes		2-4	Was still busy studying, but I would've taken all teaching resources from my class so that I can be prepared for making videos at home for the lessons.	Our school had school online with the help of powerpoint presentations being made and shared to parents.	None that I know of.	The school I work at communicated via video calls, emails and whatsapp groups.	The school I work at communicated via video calls, emails and whatsapp groups.	WhatsApp and MS Teams; whatsapp was for interaction between teachers and parents to communicate about school work that should be done at home and how and what to do. Teams for interactive lessons like in a class setting, so learners could have interaction with you and peers.	Yes, Whatsapp.	None	Equipping teachers with skills to make good powerpoint presentations so it is easy for learners to use it, giving teachers something that can help them focus on the most important facts (all the facts in one book, something like that).	N/a	Learners who were booked off because of covid had to come fetch their books and their parents had to keep them up to date until they're back.	Learners in Gr 4 (covid '19 Gr 1) are very behind with their reading abilities and operations in maths.	Not sure.	The department has adjusted the weekly time and has made the time for life skills less and Language and Maths more, if I am not mistaken.	Not that much, but learners expect to recieve everything and don't want to think and figure it out for themselves.	Nope I was still studying.	No		
T12 - Q4	Yes		10	We made booklets, readers	Online through WhatsApp	DBE was our main resource. Explain through wapp (new concepts)	Contact through w.app	Yes we had a drive through for parents to collect work.	WhatsApp	Yes, WhatsApp and MS Teams	Virtual workshops were done.	n/a	yes	New work were explained on groups.	Coverage of curriculum is done as pre-covid. Intervention is key. re-teaching, repetition, peer-teaching	all concepts are still relevant	Workshops. Recovery teaching plans (ATP)	no	Concentrate more on concreate than abstract. Not quantity but quality	No		
T13 - Q4	Yes		5+	Everyone in paric mode. Uncertain about things.	WhatsUp. Collection of learner material @ school.	none	Whatsup	Yes, parents and learners collected it at school and whatsup	Yes whatsApp	WhatsApp	/	Recovery ATP coverage (revised)	Yes google	/	Following ATP, DBE books, Workshops and assessments	/	Workshops	/	/	Yes		
T14 - Q4	Yes		/	Creating an online group for my class	Sending work books and activities home and through the Watsapp group give instruction what do and when	No guidelines	Contact with parents whatsapp	Yes, parents come to pick up worksheets at school - drive through	WatsApp	Yes WhatsApp	Virtual Workshops	n.a	yes	The same way for the ones at home. New work for ones at school	Curriculum coverage was done pre-covid reteaching repetition practice	all concepts still relevant	Workshops recovery teaching plans (ATP)	no	Concentrate more on concrete than abstract. No quiting by quality	No		
T15 - Q3	Yes		25	The principal send letters out to inform them about the news they received from the department.	The principal established a group and communicated in the group. Parents must fetch learners booklets and online activities.	We used ATPs that the department gave us as well as online workshops combined concepts/ reducing workload (interim - ATP)	We had a WhatsApp group for office admin, for the learners and educators. We created groups for group 1 and group 2 on alternate days (2 cycles).	Yes we used work packs every month. We made appointments for parents to fetch the work.	Yes we used WhatsApp and the website to guide parents of the work that had to be done.	Yes, WhatsApp groups.	We received a revised ATP for the mathematics as well as different subjects.	Maybe for them to come out and give us more support.	yes	We had to repeat the lessons because they came on different times.	We use the ATP of the Department and just working slower with difficult topics like time mathematical concepts.	No, all topics are important.	None	I would say they performed better when they were smaller groups during the pandemic. We had more time to help learners that struggled with some concepts.	No not really, it stayed the same.	Yes		
T16 - Q3	Yes		5	I made sure I have all the numbers for the parents to communicate and give work online	To maintain distance and wearing masks.	To give enough time to learners and not expect them to do as they were before.	We were using WhatsApp as a form of communication	WhatsApp to communicate with parents in terms of attending and homework.	MS Teams, WhatsApp, I used it to communicate with colleagues and conducting meetings.	WhatsApp as form of communication and MS Teams for workshops	It was that of rotations	To provide more resources that will make teaching and learning easy.	no	I never did remote teachinng	I provide extra lessons especially to children who are struggeling.	No, however, some learners are struggling with other topics.	Giving extra lessons every day and homeworks.	Yes, learners are too slow compared to previous time before COVID-19	It didn't change, it actually disturbed me a bit, however, it was fine evertually.	no		
T17 - Q3	Yes		15	Had mixed feelings about our safety. Circulars and other relevant information from GDE were communicated to us via principal.	Walk in walk out- fetching worksheets booklets and online activities	Online workshops - problem solving GDE combined core concepts/reducing the workload (interim ATP)	WhatsApp groups - online activities. Kids were divided in 2 groups attending alternate days.	Yes, work packs were compiled monthly - appointments with parents to collect on certain days.	Yes we used WhatsApp and the website to guide the parents to assist their learners.	Yes the WhatsApp groups.	We received a revised ATP for mathematics.	Not all parents have laptops- computes. Maybe make media center available to learners on certain days for an hour etc.	Yes	Prepared ahead and repeat concepts while groups rotate.	We used the ATPs form the Education Department. Slowing the pace where difficult concepts are concerned.	No. All topics are equally important.	none	It was easier to managed and assisted the learners when they were in smaller groups. We could easily detect a problem.	Not really - just taking more time to get the kids to understand the concepts. Classes are 0 and over.	Yes		
T18 - Q3	Yes		7 years	Nothing was prepared because covid-19 was a new thing in our lives and everybody was scared. The measures were difficult to adjust since we were teaching overcrowded environment.	The school suggested on using online classes eg whatsapp, Facebook quize, digital skills Microsoft. We had challenges due to most parents not having smart phones and some of our learners are staying with their grandparents whom are illeterate.	*Integrate math game's into math lessons. *I corporate visuals. *Connect math concepts to everyday life. *Allow learners to explain their reasoning. *Give frequent feedback and direction. *Reward progress. *Personalized lessons. *Use hands on learning methods.	I had contact with the school via whatsapp and emails but no contacts wih my learners because they had no phones.	No	No	No	*Annual Teaching Plans were amended. *Learners attended in groups to maintain social distancing. *All covid protocols were adhered. *The department of basic education hired education assistants and general assistants to various schools to assist teachers with sanitizing learners and help to maintain social distances.	I wanted the department of education to provide projectors, laptops, smart board to make teaching and learning enjoyable to learners and teachers.	NECT and COELT to download stories, songs, rhymes and big books.	It was very difficult and confusing to both learners and teachers. *Teachers forgot topics to teach according to their groups. *Learners used to forgot what they have learned the previous week because they attended school 3 days a week and 2 days a week.	Yes, we are having extra classes and grouping learners whom are behind to catch up.	No, all content is still relevant.	The hours of teaching mathematics has increased, this gives me extra time to introduce intervention programs to learners with barriers and extra time to complete DBE in the classroom.	Yes, there is vast difference because during pandemic some topics were removed and we did not support learners with barriers, we were just pushing the curriculum coverage.	Safety precautions during pandemic were followed but as of now we are freely teaching learners and assisting them one on one without fearing anything	No		

APPENDIX 9: POWERPOINT DBE (2020G)

https://d.docs.live.net/27bdd63f3fb1607a/Master/ATPs/FP%20MATHEMATICS%202020%20NATIONAL%20ATP_AMENDMENTS%20PRESENTATION%20GRADE%20R-3_JUNE_ENG.pptx





Summary: Amendments to: Content Overview for the Phase …(7)

Topic	Grade R	Grade 1	Grade 2	Grade 3
4.2 Length	No change	No change	Removed	Removed
	NB: Length will be taught only in Grade R and 1 during term 3 and 4 of 2020. Special care must be taken to enforce **Social Distancing** when doing formal or informal measuring. Teachers must be vigilant. Individual sets of apparatus are required. Thorough washing of the apparatus where applicable must happen once used.			
4.3 Mass	Removed	Removed	**No change**	Removed
	NB: Mass will be taught only in Grade 2 during term 3 and 4 of 2020. Special care must be taken to enforce **social distancing** when doing formal or informal measuring. Teachers must be vigilant. Individual sets of apparatus are required. Thorough washing of the apparatus where applicable must happen once used.			
4.4 Capacity /Volume	Removed	Removed	Removed	**No change**
	NB: Capacity/Volume will be taught only in Gr3 during term 3 and 4 of 2020. Special care must be taken to enforce **Social Distancing** when doing formal or informal measuring. Teachers must be vigilant. Individual sets of apparatus are required. Thorough washing of the apparatus where applicable must happen once used.			

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Summary: Amendments to: Content Overview for the Phase …(8)

Topic	Grade R	Grade 1	Grade 2	Grade 3
4.5 Perimeter				Removed
4.6 Area				Removed
5.1 Collect and sort objects 5.2 Represent sorted collection of objects 5.3 Discuss and report on sorted collection of objects	• No changes. • It is recommended that… o The attendance register and weather chart completed daily be used as an opportunity to collect data. o In NOR, learners are expected to collect, count and compare objects which lends itself to a Data Handling exercise. o These skills should be integrated in Space and Shape where sorting is done according to a specific feature (colour, size, shape) o When doing measurement and comparing quantities.			

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Summary: Amendments to the Content Overview for the Phase…(9)

Topic	Grade R	Grade 1	Grade 2	Grade 3
5.4 Collect and organise data 5.5 Represent data 5.6 Analyse and interpret data		• No changes. • It is recommended that: o The attendance register and weather chart that are done daily be used as an opportunity to collect data. o In NOR, learners are expected to collect, count and compare objects which lends itself to a Data Handling exercise. o These skills should be integrated in Space and Shape where sorting is done according to a specific feature (colour, size, shape) o When doing measurement and when comparing quantities		

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3. Amendments to the Annual Teaching Plan

Summary: Reorganisation of content topics

Numbers, Operations and Relationships:

- **Mental maths 1.16 is integrated** throughout and is advocated as best done alongside counting. E.g. from the start if we count forward in ones. We can strengthen this teaching by asking mental questions like what comes after, before, add 3 more, make 2 less, etc. Counting cannot be a rote learning activity but must be carefully planned for and well executed.
- **Place Value 1.5** is removed from term 3 and only completed to **15 in the 4th term Gr1**.

Summary: Reorganisation of content topics

Numbers, Operations and Relationships:

1.6. Solve Problems in Context:

Solving problems in context (1.7 – 1.9) demands absolute understanding of the problem solving strategies– how do we ensure this…provide the learners the opportunity to demonstrate/ verbalise their understanding of +, -, grouping, sharing as the acquired skills (in problem solving) that support the **techniques to do the …**

1. 12 Context free Calculations (1.12-1.14)

Summary: Reorganisation of content topics

Patterns Functions and Algebra:

- **Number Patterns 2.2 is** integrated **with counting forward and backwards in NOR –** the teacher must be vigilant - all the counting related topics aim to develop the number sense.

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Summary: Reorganisation of content topics

Space and Shape:

- can be integrated with NOR (sorting shapes and objects)
- when sorting 2D shapes and 3D objects according to colour, size, etc. this also lends itself to data handling (pictograph)
- 3D objects and 2D shapes are also integrated in the teaching of patterns.

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Summary: Reorganisation of content topics

Measurement

- **Time** is taught throughout as it involves all we do i.e. by the minute. The onus is on the teacher to take cognisance of time throughout the teaching day. (days of the week , months of the year, birthdays, etc.)
- The other topics have been divided as follows:

Grade R	Grade 1	Grade 2	Grade 3
Length	Length	Mass	Capacity/ Volume
		Time	

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Summary: Reorganisation of content topics

Data Handling

- Some topics may naturally lend itself to a data handling exercise e.g. the topics in Measurement e.g. **time, mass, length, capacity/ volume** will also lend itself to data handling activities.

Summary: Amendment to the weighting of content areas

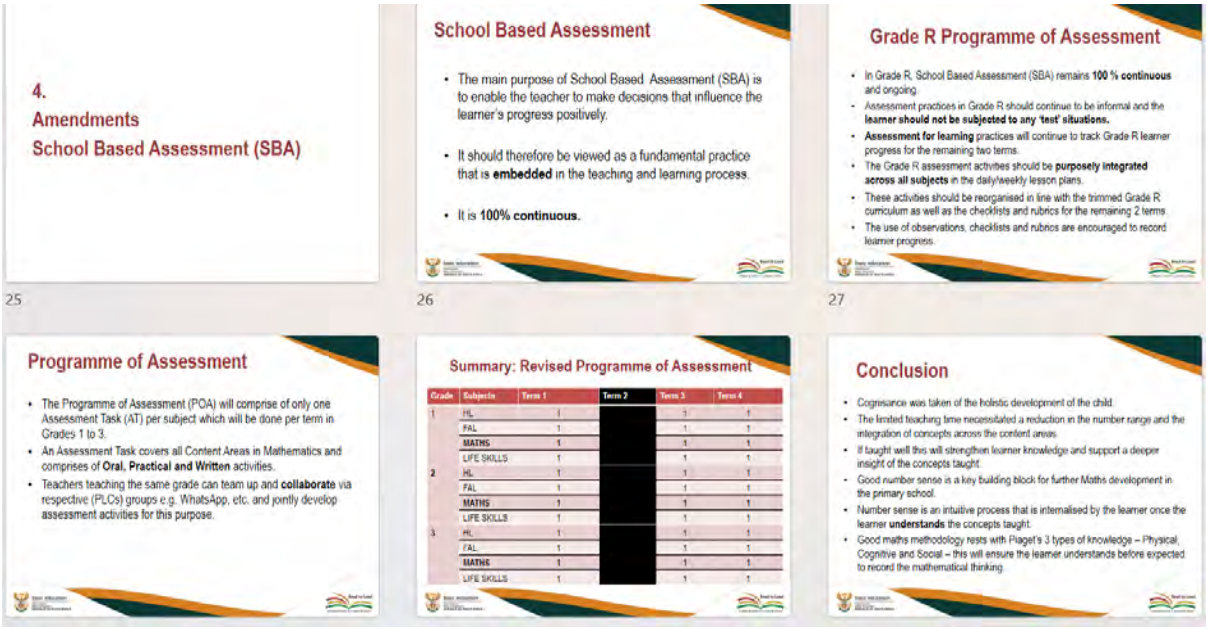
The weighting of mathematics content areas serves two primary purposes:

1. The weighting gives guidance regarding the **time** needed to address the content within each content area adequately.
2. The weighting gives guidance regarding the **spread of content** in assessment.

Summary: Amendment to the weighting of content areas

- The weighting of content areas remains unchanged across the phase.

Grade	CA1: Numbers, Operations and Relationships	CA2: Patterns, Functions and Algebra	CA3: Space and Shapes (Geometry)	CA4: Measurement	CA5: Data Handling
1	65%	10%	11%	9%	5%
2	60%	10%	13%	12%	5%
3	58%	10%	13%	14%	5%


4.
Amendments
School Based Assessment (SBA)
25
School Based Assessment
• The main purpose of School Based Assessment (SBA) is to enable the teacher to make decisions that influence the learner's progress positively.
• It should therefore be viewed as a fundamental practice that is embedded in the teaching and learning process.
• It is 100% continuous.
26
Grade R Programme of Assessment
• In Grade R, School Based Assessment (SBA) remains 100 % continuous and ongoing.
• Assessment practices in Grade R should continue to be informal and the learner should not be subjected to any 'test' situations.
• Assessment for learning practices will continue to track Grade R learner progress for the remaining two terms.
• The Grade R assessment activities should be purposely integrated across all subjects in the daily/weekly lesson plans.
• These activities should be reorganised in line with the trimmed Grade R curriculum as well as the checklists and rubrics for the remaining 2 terms.
• The use of observations, checklists and rubrics are encouraged to record learner progress.
27
Programme of Assessment
• The Programme of Assessment (POA) will comprise of only one Assessment Task (AT) per subject which will be done per term in Grades 1 to 3.
• An Assessment Task covers all Content Areas in Mathematics and comprises of Oral, Practical and Written activities.
• Teachers teaching the same grade can team up and collaborate via respective (PLCs) groups e.g. WhatsApp, etc. and jointly develop assessment activities for this purpose.
Summary: Revised Programme of Assessment
Grade Subjects Term 1 Term 2 Term 3 Term 4
1 HL 1 1 1
FAL 1 1 1
MATHS 1 1 1
LIFE SKILLS 1 1 1
2 HL 1 1 1
FAL 1 1 1
MATHS 1 1 1
LIFE SKILLS 1 1 1
3 HL 1 1 1
FAL 1 1 1
MATHS 1 1 1
LIFE SKILLS 1 1 1
Conclusion
• Cognisance was taken of the holistic development of the child.
• The limited teaching time necessitated a reduction in the number range and the integration of concepts across the content areas.
• If taught well this will strengthen learner knowledge and support a deeper insight of the concepts taught.
• Good number sense is a key building block for further Maths development in the primary school.
• Number sense is an intuitive process that is internalised by the learner once the learner understands the concepts taught.
• Good maths methodology rests with Piaget's 3 types of knowledge – Physical, Cognitive and Social – this will ensure the learner understands before expected to record the mathematical thinking.