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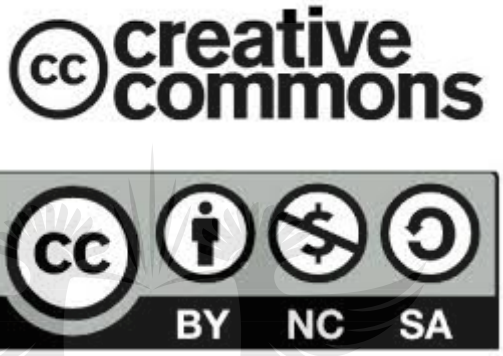

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Surname, Initial(s). (2012). Title of the thesis or dissertation (Doctoral Thesis / Master's Dissertation). Johannesburg: University of Johannesburg. Available from: http://hdl.handle.net/102000/0002 (Accessed: 22 August 2017).

CAPS TEACHING TIME: IMPLICATIONS FOR GRADE 3 MATHEMATICS EDUCATION IN THE FOUNDATION PHASE

by

JAYD DONNA DAVIS

MINOR DISSERTATION

submitted in partial fulfilment of the requirements for the degree

MAGISTER EDUCATIONIS

in

EDUCATIONAL CURRICULUM POLICY EVALUATION

in the

FACULTY OF EDUCATION

at the

UNIVERSITY OF JOHANNESBURG

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October 2019

Abstract

The study explored how the implementation of the time allocated for teaching mathematics concepts in the Curriculum Assessment Policy Statements (CAPS) was understood by Grade 3 teachers. A case study design and phenomenological approach were used to explore how the teachers' interacted and communicated the concepts to the learners to meet the requirements of the prescribed time. Semi-structured interviews and observations were used for collecting data. Amongst others, the theories (1996), Bernstein (2000) and MacIntyre (1981) were used to frame the study and make sense of the data. The findings indicate that the teachers used mainly 'carpet' or group teaching. Translating the allocated time as suggested by the CAPS was challenging. Their teaching strategies were also mainly ineffective and not beneficial to the learners. The conclusion in the study is that teachers need assistance that will enable them to interpret the CAPS as suggested. However, unless they are adequately qualified to teach FP mathematics, the implementation of the CAPS will continue to be compromised.

Acknowledgements

First and foremost, I wish to express my heartfelt and sincere appreciation to my supervisor, Professor Maropeng Modiba, for the support that made it possible for me to complete this minor-dissertation. I am indebted to her generosity, selfless support and especially for the excellent example she set. Her patience displayed for the last three years has been exemplary and without it, this work would have never been shaped as it is. In particular, the time, guidance and prompt feedback she generously provided provoked my thinking and motivated me to read and learn more each day. Her deep insights were influential in developing my insights throughout the various stages of this study.

I would also like to express gratitude to my co-supervisor, Professor Mdutshekelwa Ndlovu - thank you for your invaluable advice. I hope I have succeeded to draw on your guidance in my efforts to enhance the quality of this minor dissertation and contribute insights that are useful for the teaching and learning mathematics at the FP level. Without your constructive comments and guidance, the minor dissertation would not have been enriched.

Words cannot express the feelings I have for my mom and my grandmother for their constant and unconditional support both in my studies and career. Mom you have been a constant source of strength and inspiration to me, especially in the moments when there was no one to answer my queries. Thank you. Your prayers sustained me despite the many difficulties I have faced for all these years.

I must also express my gratitude to Tobia Serongoane, my life partner, for his continued support and encouragement that motivated me to do my best and, specifically, for always believing in me, even when I had doubts about myself. Your willingness to proofread countless pages of my minor – dissertation will never be forgotten.

Above all, I thank God, my Father, the Highest and Almighty, for guiding me through this journey of life. I felt your guidance day by day in every stage of this minor dissertation. Thank you Lord, for your endless blessings that has been showered upon me. I will always remain grateful to you God.

Plagiarism Declaration

I, Jayd Donna Davis, declare that this minor dissertation, entitled **"**CAPS Teaching Time – Implications for Grade 3 Mathematics Education in the Foundation Phase", is my own original work. All relevant sources have been acknowledged and a full reference list has been provided. I am aware of rules against plagiarism and I declare that I have not copied and used any work by another person or institution without acknowledging them according to the referencing system requirements.

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List of Abbreviations/Acronyms

ANA	Annual National Assessments
CAPS	Curriculum Assessment Policy Statements
CEMIS	Centralised Educational Management Information System
DBE	Department of Basic Education
DoE	Department of Education
FET	Further Education and Training
FP	Foundation Phase
LTSM	Learning and Teaching Support Materials
NCS	National Curriculum Statement
OBE	Outcome-based education
OTL	Opportunity to Learn
RNCS	Revised National Curriculum Statement
SIMS	Second International Maths Study
WMC-P	Wits Maths Connect Primary project

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Chapter 1: Introduction

1.1. Background to the study

By the time South African learners exit primary schooling, they are expected to have grasped the concepts of counting and arithmetic when they enter high/secondary school. The concepts (counting and arithmetic) are considered as foundational for more complex concepts introduced at high school, such as algebra and other mathematical concepts (Ensor, Hoadley and Jacklin, 2009). However, a study conducted by Ensor et al. (2009) indicate that the majority of South African Grade 3 children who exit the primary school level lack this foundation. The study (Ensor et al., 2009), revealed that the performance of these learners in mathematics was extremely poor. The average score was 30% on numeracy tasks. In 2006, the results for the same grade showed that more than 60% of learners were performing below the expected level for literacy and numeracy (see also Department of Education, 2006). A major factor that could be contributing to these low levels of performance according to Fleisch (2008) is the instructional time that learners receive in the classroom. Teachers seem to spend significant time on the high volume of administrative tasks rather than teaching the curriculum subjects. Among a wide range of critical issues, language emerged as a challenge. Even though many learners in have a very limited command of English, which they should be learning when they enter school, they are expected to comprehend complex mathematical terms easily. In the view of Ensor et al. (2009), texts make up the 'semiotic' system which teachers organise in classrooms when they teach. The texts include, among others, any statement, expression, object, or writing which teachers communicate to learners during lessons. However, there seems to be no uniformity of time and coherence in practice among teachers and across schools. These aspects are crucial to the progression in acquiring the number concept, the shift from concrete to abstract reasoning, and the progression from counting to calculating, in short, mastering foundation phase numeracy.

Even though, for example, the 2014 Annual National Assessments (ANA) indicated that the national mean result at Grade 3 stood at 55.5% and showed improvement from 41.2% in 2012 to 53.1% in 2013 (DBE, 2014, p. 50), according to Adler and Sfard (2017), currently the education system in South Africa is generally viewed as still failing the majority of learners. Many learners' results are often well below the levels stipulated in the National Curriculum Statement (NCS) (Department of Basic Education, 2014), and these persistent levels are firmly fixed in the national landscape by the end of the foundation phase (Grade R to Grade 3; five to eight-year-olds)

(Fleisch, 2008). For example, numeracy, according to regional and international studies, is lower than in countries such as Madagascar, Malawi, Zambia and Botswana (Ensor et al., 2009). Data obtained through the Centralised Educational Management Information System (CEMIS) submissions of schools in the Western Cape, also indicate this pattern of poor achievement in mathematics Between 2002 and 2006, learners' overall performance and numeracy levels in formal tests and examinations dropped from 36.6% in 2002 to 32% in 2006 (Western Cape Education Department, 2006). By 2007, this had increased slightly to 35% (Ensor et al., 2009). Fleisch (2008) has argued that these learners are disadvantaged by the instructional time they receive. In his view, teachers spend much of their time on the high volume of administrative tasks rather than the core curriculum subjects.

Chisolm, Volmink, Ndhlovu, Potenza, Mahomed, Muller, Lubisi, Vinjevold, Ngozi, Malan and Mphahlele (2000) also found that the actual percentage of time teachers spent teaching ranged from 6% to 56%. Time was mostly devoted to organising portfolios and preparing work. As a result, there were discrepancies between the officially allocated teaching time on the school timetable and the actual teaching time in schools. The shortfall is in actual teaching time and there has been no considerable change over the years. These factors contributed to low learner achievement rates in the foundation phase. As a result of this poor performance, the University of the Witwatersrand began a longitudinal study and development project, the Wits Maths Connect Primary project (WMC-P), which focused on investigating and developing interventions to improve the teaching and learning of mathematics in ten government primary schools (Askew, Venkat & Mathews, 2012). The findings show that the teachers had the knowledge to teach learners but relating and conveying this knowledge to the learners was a difficult task. Their problems were related to the teaching strategies they used for the subject content of mathematics.

Reeves and Muller (2005) have identified curriculum coverage, coherence, cognitive demand, and pacing as other factors that contribute to the general poor learner performance, especially in the foundation phase. They argue that the ways in which teachers 'scaffold' learning, that is, connect group teaching and the individual efforts of learners as well as differentiating between verbal and written work, including tasks for different learners, has remained substantially the same over time (see also Jacklin & Hardman, 2008; Schmitt, 2009). In addition, deciding on how much time to spend on a topic, that is, time spent speaking - allowing learners to speak and the pace and order of topics within and across the whole time table highlight problems in relation to teacher's professional decision-making as regards the organisation of lessons. Timetables are

usually drafted in schools by the deputy principal to ensure that they are always in harmony with the CAPS policy. The principals are also in charge of curriculum supervision.

Although the CAPS policy has included a table with weekly time allocations to guide teachers' pacing for topics, it would appear that teachers are unable to comply with these recommendations. For example, seven hours are to be used for mathematics per week, and every lesson should be 1 hour 24 minutes per day (Department of Basic Education (DBE), 2011). As regards subject content, there are specific concepts that should be taught for a specified recommended amount of time (DBE, 2011, p 37). The content includes the following main concepts: numbers, operations and relationships, patterns, functions and algebra, data handling, space and shape (geometry), and measurement. Educators, therefore, are expected to draft their teaching timetables according to these guidelines while ensuring that every aspect of the prescribed content is covered, taught, and learnt properly. In addition, since the content areas have specified weightings indicating how much they should contribute to a learner's performance, the guideline has to be accommodated in personal teaching timetables as well.

1.2. Time-tabling as a concept

Cipriani (2013) has argued that time-tabling or periods in schools determine the relationships during lessons. He distinguishes four types or modalities of time; namely, micro-time, meso-time, macro-time, and mega-time. Micro-time is a specific instant, that is, a fleeting moment that flows rapidly. Aveni (1993) describes it as a measure of intervals between events. Meso-time is related to an entire existence and experiences, for example, phases of being awake and asleep while macro-time refers to information that is available, for example, in an extremely old document or footage available. Mega-time is limitless and without any effective interruption or beginning. Time within a schooling system can thus be viewed as micro-time since it is concerned with a specific period of an eight-hour school day in which the learners are in a controlled environment. Social cues for all stakeholders in this environment operate according to specific rules that guide interactions between individuals. As a result, in Cipriani's (2013) view, when considering time at the school level, we focus on it as a social construct.

Social time, according to Cipriani (2013), is the 'gist' of everyday experience and decisions. During this time, events may be unpredictable, despite the efforts made by individuals to influence them. At the school level, it is controlled through scheduling and planning every minute of the day's

lessons, lunch, meetings and extra or co-curricular activities, often through education policies that leave little to chance.

1.3. Problem statement

The use of time has been a recurrent concern for educators, and it is now receiving more attention in debates and writings on educational reform. For example, O'Meara, Prendergast and Robinson (2006), writing on influential factors in assigning time to mathematics instruction in secondary schools in Ireland, argue that decisions on how to allocate instruction time between curriculum subjects contributes significantly to learner achievement. However, in South Africa, while there is much research available on the nature of mathematics and poor learner performance in mathematics (Ensor et al., 2009; Keiser & Lambdin, 1996), there is little literature available on how time is understood, managed and utilised when teaching.

Numerous other studies on the mathematics curriculum in South Africa (Adler & Pillay, 2016; Adler, Alshwaikh, Essack & Gcsamba, 2017), the mathematics curriculum policy documents (Stoessiger & Ernest, 1992; Klein, 1992), poor learner performance, poor structuring of previous curriculum (Chisholm, 1992), teaching content and implementation (du Plessis, 2013) do not deal specifically with pacing and time allocation, especially in the foundation phase (FP), even though it is considered a critical aspect for instruction. Taylor, van der Berg and Mabogoane's (2013) research is thus very useful as it is one of the few studies focusing on the use of time in South African classrooms and during lessons. The report highlights the general challenges of managing time in schools. Interest in conducting this study was triggered by this Taylor et al.'s (2013) report.

The CAPS documents provide guidelines in the form of recommended teaching time per content area per week (DBE, 2011, p. 42). However, these recommendations are not always understood. This study investigated how the Grade 3 teachers understood the time allocated for mathematics concepts, translated it into classroom interactions, managed and used it during their lessons. Therefore, in the study understanding time had to be reflected by how the interactions and experiences between educators and learners were used and managed to meet the outcomes set by the CAPS for the different concepts that had to be taught at Grade 3. The study specifically focused on the relationship between how the time allocations stipulated in the CAPS document were adhered to in actual pedagogical practices when teaching mathematics to Grade 3 learners. The assumption was that teachers understood how this time had to influence how they designed and presented their lessons. The interactions, activities and other artefacts that they used had to

create a lesson environment that facilitated the learners' internalisation of the essence of concepts associated with the subject content taught.

1.4. Research questions

The main research questions were the following:

1. How do FP teachers understand and implement the time allocated, by the CAPS for teaching problem solving in mathematics Grade 3?
2. What are the implications for teaching and learning problem solving in mathematics?

The following were the sub-questions to be answered:

- What teaching strategies and classroom interactions do the teachers use when teaching problem solving in mathematics Grade 3?
- What did they do to ensure that the learners understood the concepts and procedures that the CAPS indicated as important for understanding problem solving?
- How were the strategies and classroom interactions used by the teachers linked to how they understood the time that CAPS for Grade 3 mathematics prescribes for teaching problem solving?
- How does the teachers' understanding and implementation of the time allocated for teaching problem solving influence learning mathematics at Grade 3 level?

1.5. Aim of the study

The aim of this study was to investigate FP teachers' understanding and implementation of the time allocated by the CAPS to teach problem solving in Grade 3 mathematics.

The following were the objectives of the study:

- Identify the teaching strategies and classroom interactions the teachers used when teaching problem solving in Grade 3 mathematics.
- Explain what the teachers did to ensure that the learners understood the concepts and procedures that the CAPS indicated as important for understanding problem solving.
- Establish how the strategies and classroom interactions used by the teachers were linked to how they understood the time that CAPS for Grade 3 mathematics prescribes for teaching problem solving.

- Establish how the teachers' understanding and implementation of the time allocated for teaching problem solving for Grade 3 mathematics influenced mathematics teaching and learning at Grade 3 level.

1.6. Rationale of the study

Magome and Nkosi (2014) argue that the problems faced in education in South Africa are mainly concerned with the quality of teaching and that the pass rates need to be reviewed based on quality rather than quantity. For example, the government is focused on the presentation of pass rate results each year rather than the actual learning that has taken place in classrooms. Drawing on this perspective, the study looked at how teachers understood and implemented the allocated time for teaching problem solving in FP mathematics Grade 3, to establish how or not their interpretation of the time and its translation into practice met the requirements of the set outcomes.

Curriculum problems in South Africa are linked directly to the specific CAPS guidelines given to teachers. For example, the number of activities to be done by the learners have resulted into very heavy daily workloads for the teachers (Adler et al., 2017). Teachers cannot overlook the activities in their work and this has compromised the ways of managing the expanding curricula (du Plessis, 2013). The study was conducted to establish how this was the case.

Adams (2005, p. 32) in her report on the sources of innovation, offers some recommendations on how the educational system can foster students' innovative and creative skills, arguing that "a rigid environment that adheres too strictly to procedure does not foster creativity". If teachers are limited in terms of approaches and strategies that could be used in the classroom due to time constraints, their creativity will be limited when planning lessons and during the implementation of those lessons. By contrast, an entertaining, cheerful environment where there is comfort with vagueness and a focus on ideas rather than careers is favourable to innovation (Amit & Gilat, 2012, p. 33). However, with the current prescriptive CAPS document, fostering an environment which is favourable and innovative seems impossible. The study was conducted to explore how, for example, the manner in which the Grade 3 teachers used the allocated time for mathematics influenced their teaching and learning.

The CAPS was introduced in 2011 and, according to, for example, Adler et al.(2017), educators appointed before this time were not been adequately guided to teach the National Curriculum. This implies that some practicing Grade 3 mathematics teachers may not be fully equipped with knowledge and skills to interpret the topic-by-topic teaching time allocations and implement them

effectively. It is for this reason that the study focused on how educators with different teaching experiences used the time stipulated in the CAPS to teach mathematics and how their teaching strategies influenced the success of lessons.

An investigation of teachers' cultural and instructional practices explained the variation in their performance, in particular, how the length of time spent on subject-content was directly linked to a learner's achievement (Reeves & Muller, 2016, p. 46). Therefore, the study was conducted to establish the relationship between the time teachers devoted to a content area and learners' achievement, and if not, what compromised it.

1.7. Conceptual framework

MacIntyre (1997) has argued that every practice requires a specific relationship between those who participate in it. For example, teaching cannot take place without establishing the relationship between the teacher and the learner in relation to the subject content that is taught and must be learnt. Through pedagogy, this relationship defines or shapes the roles of individuals as they engage with the subject content. Those in authority set standards of excellence and those who accept such authority work towards achieving the standards.

MacIntyre (1981) distinguishes between two kinds of 'goods' that can be gained in a practice, namely, those *internal* to the practice and those *external* to it. Internal goods are related to achievement for those who participate in a practice; "… they can only be identified and recognised by the experience of participating in the practice in question" (MacIntyre, 1981, p. 188). In contrast, external goods refer to the property and possessions legitimately acquired, purchased or acquired through unscrupulous means. This can involve competition in a case where there is a winner and a loser. It is, however, possible to acquire and enjoy both types of goods and often external goods can lead to internal goods, if their acquisition is virtuous. However, since external goods are associated with material advantage, virtues are not always compulsory for them. However, for internal goods, virtues are important as the highest human quality and condition for ethical practice.

Furthermore, MacIntyre (1981) argues that meaningful learning is situated in a practice, which he defines as a rational and complex form of cooperative human activity which is socially established and is informed by standards of excellence, obedience to rules and achievement of goods. These goods are constituted by the feeling that comes from achievement rather than some external good which could be in the form of for example, monetary value or award. The standards and rules are

historical, compulsory, prescriptive, and non-negotiable. For this reason, participants involved in learning are made aware of what is expected of them, how to behave, and how they will be judged to ascertain whether they have abided by the rules or achieved the standards and goods associated with a practice. Given the prescriptive nature and non-negotiable standards of excellence, participants are aware that "to enter in a practice is to accept the authority of those standards and the inadequacy of one's own performance as judged by them [seniors of the practice]" (MacIntyre, 1981, p. 189). Thus, failure to accept the authority of the best standards, acknowledged as such at a particular time, not only affects initiation but also acceptance of a practice. Undermining the rules constitutes a dismissal of the practice.

In MacIntyre's (1981) view, for a practice to be learnt and properly internalised, not only standards of excellence and obedience to rules (discipline) are important, but the whole teaching and learning enterprise, which has to lead to the achievement of 'goods'. These are goods that cannot be achieved unless there is familiarity with the standards of excellence and behaviour that is required by the practice. Without this condition, neither the achievement of the goods essential to the practice nor permission to enter it are possible. For anyone to be part of a practice, they must do and act as told or show a desire to do so.

Virtues require obedience to rules with the intention of achieving set outcomes. MacIntyre (1997) argues that, in terms of quality, they enable individuals to define their social role, assist them to achieve goals, and become successful. They are monitored through the rate at which an individual is able to excel, and progress is judged based on the level of performance by the authority figures. This can be through focusing on internal and external goods. Therefore, to enter into a practice is not merely to enter with those who are currently involved but those whose ideas came before and are still included. Therefore, in the context of teaching and learning, virtues are important for an individual to enjoy the goods internal to a practice. Since these practices have to work systematically, to achieve excellence through submission to standards and obedience to rules, they do not only involve technical skills, but inter-subjective relations that facilitate the internalisation of what has to be or is learnt (MacIntyre,1997).

The central constructs of such inter-subjectivity, according to Jaworski (2015), concern the meanings that human beings make in relation to each other and the tasks in which they are involved. Recurring patterns of inter-subjective transactions involving the task, result in the generation of principles that unconsciously organise a learner's successive experiences (Jaworski, 2015). Forged meanings within the teaching system form the basic building blocks of

development. Thus, it is reasonable to conclude that in lessons, such inter-subjectivity can be considered as related to how time is used among individuals within a school system.

1.8. Research design and methods

A research design is a framework of methods that serves as a link between research questions and the implementation of the research (Durheim, 1999, p. 29). In this study, individual Grade 3 mathematics teachers' everyday life experiences were researched to understand how their use of the recommended time could be linked to the learners' performances. A narrative qualitative design (Patton, 2002) was used to capture participants' lived experiences during their lesson time and told as individual stories of teachers' interactions with learners during Mathematics lessons.

1.8.1. Research approach

People have their own unique experience of their lived reality and such reality is subjective. Therefore, the phenomenological approach was used in this study (Maree, 2010) to examine the ways in which the participating educators conducted themselves in the Grade 3 lessons when working with the time prescribed for teaching the subject content of mathematics. In phenomenological studies, the researchers disregard their own experiences in order to understand those of the participants in the study (Creswell, 2009). Paying special attention to the teachers' activities and how they described or explained them, had to clarify their understanding of the significance of the recommended instructional time (as micro-time) for the various topics of the Grade 3 mathematics subject content. Examining each educator's lived reality in this particular situation as their unique experience (Maree, 2010), had to help clarify how they understood and translated into practice, the time guidelines they are expected to follow in the CAPS for FP mathematics.

1.8.2. Research methods and process

In this study, inductive methods were used to develop insights into the teacher's understanding and use of time allocation (Maree, 2010). Data was collected through classroom observations and in-depth interviews with four Grade 3 educators in an environment that was relaxed and free of any form of pressure (Creswell, 2009).

Classroom observations were conducted to obtain first-hand data on how the individual teachers conducted themselves in Grade 3 mathematics lessons as specific settings. What happened in these settings was of special interest (Henning, van Rensburg & Smit, 2010). The educators were thus observed in their usual classroom environment, teaching a mathematics lesson. The observations were video-d and audio-recorded in order to ensure that the researcher captured every moment. The language in use and other symbols, such as pictures and apparatus used in the lessons as part of the classroom setting (Henning et al., 2010) were useful as primary data that was natural and unaffected by factors outside the classroom environment (Creswell, 2009). The data helped indicate how the learners were encouraged to be obedient to rules and how standards of excellence were made accessible to them. During classroom observations, the mathematics lessons were video recorded and field notes taken.

The interviews were semi-structured with primarily open-ended questions. Semi-structured interviews consist of open and close-ended questions that each interviewee should answer. At the same time, additional questions could be asked to clarify or further explain issues (Creswell, 2009). The benefits of such interviews include the prospect of collecting detailed information about the research questions. In addition, with this type of primary data collection, the researcher has direct control over the flow of the process and a chance to clarify issues during the process if needed (Creswell, 2009). In this study, the teachers were allowed free expression in explaining what the time stipulated to teach topics for Grade 3 mathematics meant to them, theoretically and as practice when devising teaching strategies.

The interview questions referred to how the time stipulated time in CAPS (DBE, 2011) for specific topics was translated into practice by means of teaching methods, activities and other artefacts or resources used in the lessons. The interviews were audiotaped. Creswell (2007) recommends making audiotape recordings as they are easier to transcribe later.

The interviews were conducted with each teacher individually. Open-ended questions were asked and the teachers were allowed as much time as they needed to fully describe how they understood the time stipulated in the CAPS and, dealt with it when planning and presenting their lessons. To relax the teachers and ensure that they freely participated in the interviews, the interviews were conducted at the end of the school day at a time and place convenient to them. Keeping an open mind, also ensured that they gave answers they considered relevant to the focus of the study (Maree, 2010).

1.8.3. Sampling

The sampling method used in the study was both purposive (Scott & Morrison, 2006) and convenient (Creswell, 2009). Purposive sampling is a technique in which a researcher relies on their own judgment when choosing members of the population to participate in the study and all other information not pertaining to the topic is discarded (Maree, 2010). The teachers were purposively selected in one public junior primary school in the south of Johannesburg. There was also convenient to the researcher because of its close proximity to the researcher's place of residence.

One school was selected because of the limited scope and time available to conduct the study. It (school has four Grade 3 classrooms, and a focused and theoretically informed judgement ensured that the researcher selected individual teachers with characteristics that best enabled her to answer the research questions (Maree, 2010). All four teachers agreed to be involved in the study. To identify them, the researcher used non-probability sampling because, at first she thought that not every Grade 3 mathematics teacher had an equal chance of being selected. Interest was only on those who were teaching a particular topic at time the field study was conducted (Creswell, 2009). The teachers were also supposed to be experienced and willing to reflect and explain how they understood the time allocation in the CAPS and dealt with it in practice. Therefore, the selected four Grade 3 teachers had been teaching mathematics for five or more years. The assumption was that with this experience, they were familiar with the CAPS' requirements, had been exposed to several professional development initiatives that improved their understanding of it (CAPS) and the values, knowledge and skills it proposed that the Grade 3 mathematics had to develop.

1.8.4. Data analysis

Qualitative analysis changes data into findings or knowledge (Patton, 2002). Data analysis was conducted through the examination of content from the interviews and observations. The data collected through observations was first transcribed from the video recordings onto paper and divided into smaller groups of meaning through the use of the inductive method. The observation videos were studied, and teachers' behaviours and teaching strategies examined for differences and similarities. In doing so, attention was paid to how, how mathematical teaching aids (if any) and teaching strategies were used during lessons, the time spent reinforcing concepts, in particular, difficult ones for the learners and the time given for learners to complete classroom activities. The described behaviours and teaching strategies were thereafter organised

systematically through comparison, codes identified and categories developed to uncover patterns (Henning et al., 2010) of how the four teachers dealt with the time stipulated in the curriculum policy as social time.

The audiotapes containing interview data were transcribed making sure that the precise words were captured onto paper. Thereafter, the notes were coded and ideas that related categorised into groups (Henning et al., 2010). From the observations and interviews categories, recurring themes were identified and used in organising the presentation and analysis of the data in the study.

1.8.5. Ethical considerations

The researcher obtained informed consent from the school as well as the participating teachers. The researcher drew up a consent form using the ethical guidelines provided by the university. She went through this document carefully with each Grade 3 mathematics teacher to ensure that she understood the study and the questions involved (Maree, 2010). Teachers were also informed about whose voices would be represented in the final study (Hatch, 2002). According to Henning et al. (2010), anonymity in the study is also essential. The researcher should ensure that the signed consent forms are treated with the greatest discretion. Therefore, when recording the results, pseudonyms were used for all the participants involved in the research.

As the researcher I also had to be sensitive to the teachers as a vulnerable research population and deliberately deal with the imbalance in power relations amongst us including the fact that the research could place them at risk. I, therefore, explained the purpose of the study in detail and the methods that were to be used to collect data from each teacher, including the timeframes. The reason for this was that the participants could have been e fearful of disclosing information and of being labelled or stereotyped. This had to be avoided to ensure that the study was not affected adversely.

1.9. Organisation of the study

Chapter 1 gives a summary and background to the study. It discusses the CAPS curriculum policy, for Grade 3 mathematics and how the time stipulated in the document had to affect classroom pedagogy. The problem statement, research questions, aim, objectives and rationale for the study

are also explained and followed by a brief overview of the conceptual framework used, research design and ethical considerations.

Chapter 2 discusses the CAPS document on Grade 3 mathematics and highlights what is required for the implementation of this policy document. In particular, it focuses on the conceptual implications of the time stipulated, for teaching specific concepts, for teaching practices. The final section of this chapter focuses on how the CAPS links time, curriculum and pedagogy and, therefore, how the planning and teaching of lessons plays an important role in mathematics education; specifically, how the interactions between teachers and learners in the classroom impact learning.

Chapter 3 discusses the conceptual framework of the study. This framework draws on influential theorists, such as Lave (1996), Bernstein (1996), Maton (2007) and MacIntyre (1981) to describe what is essential to the type of pedagogy that has to be used for teaching and learning mathematics. Special attention is paid to the concept of inter-subjectivity that has to underpin such teaching and learning. Finally, to clarify the implications of the time allocations in CAPS for Grade 3 mathematics, principles of micro-time are used to further indicate how the allocations constitute the social time teachers have to be aware of.

Chapter 4 discusses the methodology of the study. The general qualitative research design and the phenomenological approach used are discussed to clarify how they assisted in studying the practices the teachers used to teach mathematics and explained these practices. The data collection methods, the sampling used and data analysis, are also explained. Finally, ethical considerations based on the University of Johannesburg's guidelines and other texts are discussed.

Chapter 5 presents and analyses the data collected. It also discusses the findings of the study.

Chapter 6 summarises the findings of the study, reflects on the theory, methodology, limitations of the study and then recommends areas for further study.

Chapter 2: The Mathematics Curriculum (CAPS) for the Foundation Phase

2.1. Introduction

The chapter examines the CAPS mathematics curriculum for FP with special attention paid to the time allocations given to topics and sub-topics that have to be taught in this phase. Firstly, it provides a brief historical background of the mathematics curriculum, then discusses the mathematics curriculum for FP, in particular, policy guidelines and the variations in the time allocation for the different grades and their implications for the teachers' workloads. The Grade 3 time allocation and how it differs from the Grade one and two allocations is reflected upon to highlight how it may influence classroom pedagogical practices.

2.2. Brief Historical Background of the Mathematics Curriculum

Changes to curriculum are continually implemented to meet the needs of a society. Internationally, governments are confronted by the challenges of curriculum change to meet regional, national, and global needs (Pienaar & Raymond, 2013). South Africa is not an exception. The long and challenging path of curriculum development in this country has seen policy initiatives first deviate from and then returning to prescribed and specific content and coverage thereof (Miller, Edwards & Priestley, 2010). Markers of the "Foundation for Learning" in the curriculum led to the return of specified content and the drafting of the Curriculum and Assessment Policy Statements (CAPS) the National Curriculum Statement (NCS) (Malia, 2014).The minister's foreword in the CAPS policy document clearly states that the new policy "builds on the previous curriculum but also updates it and aims to provide clearer specification of what is to be taught and learnt on a term-by-term basis" (DBE,2011, p. 4).

Neither, Curriculum 2005 nor the Revised National Curriculum Statement (RNCS), as the initial post-apartheid policies in South Africa, prescribed or indicated the emphasis to be placed on the various components of the curriculum (DoE, 2002, p. 29). The initial stages of implementation were based mainly on legislative action and new administrative structures that were centrally enforced to hold teachers accountable for a curriculum policy that they did not participate in designing. Thus, a sense of 'ownership' on the part of the teachers was lacking.

Campbell (1993) has argued that meeting the requirements of large-scale curriculum implementation on a highly pressured timescale generally produces a negative reaction from

already overworked and distraught teachers. In a radically changing environment, teachers' experience may have to be set aside until new ways of thinking and acting can be integrated with their existing skills and professional knowledge. Confusion in the interpretation and implementation of the curriculum is likely to be high, and it also places emphasis on communication skills and exhibits a low tolerance for uncertainty among teachers (Bennett, Wragg, Carré & Carter, 1992). Therefore, the working conditions of South African teachers were quite predictable, given that the change increased workloads and the accompanying stress of those workloads.

Studies such as those by the review committee for Curriculum 2005 (Chishlom et al., 2000), and the study on curriculum reform in South African education by Cross, Mungadi and Rouhani (2002), also looked at the implementation of Curriculum 2005 and they described the calamitous consequences of having the interpretation of content, sequencing, and pacing of indeterminate curriculum statements entirely up to teachers. Chisholm et al. (2000) were critical of the numerous curriculum revisions done previously and recorded problems at the levels of curriculum coverage and pacing. This lack of specification was identified as especially problematic due to the context where there are considerable gaps in teachers' content knowledge and pedagogic content knowledge (Taylor & Vinjevold, 1999). Specifically, gaps in mathematics content knowledge continued to be highlighted (Taylor, 2011).

In a study conducted on organising knowledge for the classroom, Jansen (2009, p. 100) also revealed that FP teachers lack content knowledge to teach mathematics. Phonics in literacy was also identified as a challenge. The teachers had curriculum documents as their material but did not know how to use them. Currently, in every primary school classroom, each teacher is required to have the policy documents for each subject and use these when planning lessons. They have to ensure that they adhere to the guidelines of the CAPS policy document. The CAPS documents are open source materials which present day teachers ought to be able to access and critically engage with, out of their own professional volition, without necessarily waiting to be taught. Lifelong self-directed learning is seen as a critical 21st century graduate attribute. However, a common problem has arisen in the South African school context as practicing teachers are not taught how to interpret policy and do so in relation to their individual experience and knowledge (du Plessis, 2013, p. 69).

To remedy the situation, the National Curriculum Statement (NCS) (2002) amendments took effect on January 2012. They addressed four main concerns identified by the task team and reported in October 2009 to the Minister of Basic Education (DBE, 2009). The concerns and

complaints were about the implementation of the NCS; teachers being overloaded with administration; the different interpretations of the curriculum requirements, and the underperformance of learners. The new curriculum policy was one that would be more specific and provide time allocation guidelines for the suggested amount of time to be spent on each subject. More guidelines on how to teach specific content were added to the document, especially for the FP. Teachers were given clear examples of how they were expected to teach content and how to structure lessons. Mathematics and the Home Language were allocated the most time above all other subjects that are part of the curriculum.

In short, the curriculum policy changes in South Africa, from NCS Grade R-12 to CAPS were meant to provide clearer specifications on what should be taught and learnt. Specific aims to guide instruction were provided. According to the DBE (2011), the NCS aims to produce learners:

- Who are able to identify, solve problems and make decisions using critical and creative thinking
- Who will be enabled to work effectively as individuals and as members of a team
- Who can organise and manage themselves and their activities in a responsible and effective manner
- Who are able to gather, analyse, organise, and critically evaluate information;
- Who can communicate effectively using various modes - be it visual, symbolic, and/or language skills
- Who are able to use science and technology effectively and critically but also showing responsibility towards the environment and the health of others
- Who can demonstrate an understanding of the world as a complex system, made up of a set of related systems and by recognising that problem-solving contexts do not exist in isolation (DBE, 2011, p. 10).

These aims focus on the outcomes and what the policy is set to achieve. What educators should strive for when they plan tasks and assessments is to ensure that their work is aligned with these aims. The aims are important guides for teachers as they assist with the implementation of the curriculum in accordance with the instructional time guidelines provided (DBE, 2011).

Previously, there were discrepancies between the aims in the NCS policy and thus the implementation processes. Firstly, the open-endedness and the ambiguity of the NCS document led to multiple interpretations. Hence, teachers had difficulty interpreting what was required of them by the curriculum documents (Scholtz, Watson & Amosun, 2004). Therefore, even in well-

constructed education systems with well-trained teachers this could be a difficult aspect of curriculum implementation, two issues were relevant to curriculum alignment, namely, alignment between policy and practice, and alignment between policy and cultural values. At first, the argument put forward was that there would be minimal or hardly any effect on performance in relation to the intended curriculum if what happens in the classrooms is poorly aligned with the intended practices. Second, the argument was that if the intended and practised curriculum are to support each other, the manner in which it is evaluated and the educational philosophies have to be cognisant of the prevailing value systems in schools (Scholtz et al., 2004). The curriculum should similarly take into consideration the value system of the societies outside schools as well.

It was in this light that the NCS was reviewed (2009) and the process resulted in the introduction of the Curriculum and Assessment Policy Statement (CAPS) (2012). This policy now has aims for each subject (specifically mathematics), which the previous NCS document for Grade R-9 did not have. Thus, the CAPS cannot be regarded as a new document but an adjustment which indicates to the teachers the content of the curriculum, its sequencing and the pace at which it has to be taught. All this has to be based on the interpretation of more general curriculum statements (Galant, 2013).

The aim of the NCS review was to have one, all-encompassing and concise CAPS that would furnish details on what content teachers ought to teach. Assessment would be on a grade-by-grade and subject-by-subject basis (du Plessis, 2013). Therefore, the new curriculum includes clearly defined topics for each subject and also recommends the number and genus of assessments per term (DBE, 2011). According to du Plessis (2013), this made CAPS more of an amendment on the curriculum (what to teach) and teaching methodologies (how to teach).

CAPS has extended specifications in the curriculum with instructions for weekly planning. The instructions are specific about the content to be covered, the progression in which the content is to be covered, and the duration on each content area (pace) per week for each subject area (Jansen, 2013). In addition, the policy provides 'teaching guidelines' about a methodology regarding the teaching of the content areas. For example, where the focus will be mainly on mental mathematics, the policy states that each day, for the first 20 minutes of the mathematics lesson there should be a revision of concepts and an allocation of independent activities (DBE, 2011, p. 11).

2.3. CAPS in the Foundation Phase - a focus of the Mathematics curriculum policy

The debate about CAPS is whether it reflects a curriculum amendment, or is a repackaging (du Plessis & Marais, 2012). Similar to the 2002 NCS, the 2011 CAPS did not include input by schools and teachers. Although it is detailed and includes examples of what concepts to teach and how to teach them, it has led to educators believing that they are too restricted (du Plessis, 2013). The CAPS policy states that the tasks learners engage in should however, not be for them to 'keep busy', but should rather clearly focus on mathematics, as defined in the curriculum (DBE, 2011, p11). Furthermore, it lacks time for reinforcement and creativity. Specifically, among others, a study by Adler et al. (2017) has indicated that the proportion of time spent on mathematics has a consequential effect, which in turn, would impact on learners' development of mathematical concepts and skills.

Galant (2013) points out that, in order to support these policy initiatives, the Department of Basic Education (DBE) went further and produced prescribed workbooks in which it stated that learners could use these workbooks to consolidate their knowledge by completing activities in them during their independent time (DBE, 2011, p. 101). The Department of Basic Education has also provided learners with ready-made materials and exemplars of the content to be covered in each grade for the teachers. However, not all schools are fortunate enough to have access to these Learning and Teaching Support Materials (LTSM) at times, and in these cases both the teacher and the learner are disadvantaged (Taylor, 2011). In addition, in the policy document, there are tables that indicate the number of hours to allocate to each content area and topic for each grade (DBE, 2011). For example, for FP mathematics, the document states that for Grades 1-2, the time allocation should be, on average, seven hours per week, and for the Grade 3 learners the time should be seven hours per week.

Overall, the instructional time for Grades R-2 is 23 hours, and for Grade 3 it is 25 hours. The other hours are divided for the remaining subjects with Home Language given the most hours after mathematics.

The instructional time in the FP is shown in Table 2.1 below. The proportion allocated to mathematics in Grade 3 is 28%

Table 2.1: *Time allocation for foundation phase subjects* (Adapted from DBE, 2011, p. 6).

Subject	Grade R (Hours)	Grade 1-2 (Hours)	Grade 3 (Hours)
Home Language	10	7/8	7/8
First Additional Language			
Mathematics			
Life Skills • Beginning Knowledge • Creative Art • Physical Education Personal and Social Well-Being	**6** (1) (2) (2) (1)	**6** (1) (2) (2) (1)	**7** (2) (2) (2) (1)
TOTAL	**23**	**23**	**25**

The table indicates the hours available in the school day and how time is distributed and has to be managed for all subjects. There is no administrative or 'free' time indicated for educators. The entire day should be spent engaged in teaching and learning. In terms of the guidelines, the time allocation for Mathematics and Home Language reflect their importance and thus the longer hours to facilitate better performance in the subjects. It is assumed that the more time is spent on a subject or topic, the better the results will be. Even though Grade 3 only has an additional two hours compared to Grades 1-2, the workload is substantially more (DBE, 2011). In addition, over the past two years, IsiZulu was introduced to the already packed FP curriculum in a few pilot public schools.

The CAPS policy document also has clear and specific guidelines for teaching learners in FP. There are three different types of suggested teaching methods. Firstly, there is whole class activity teaching, secondly small group focused lessons and thirdly independent work which plays a very important role in consolidation of learning. For example, the following is suggested by policy: "when engaging in whole class activity teaching mental mathematics will be the main focus, consolidation of concepts and allocation of independent activities for at least 20 minutes per day at the start of the mathematics lesson" (DBE, 2011, p. 11).

Another suggestion is that small group focused lessons are most effective, that is, a teacher taking a small group of between 8 - 12 learners, with similar ability, and sitting with them on the floor or at their tables, while the rest of the class is engaged in independent activities. The teacher works more interactively orally and practically with the small group, engaging in mathematical activities such as counting, estimation, number concept development and problem-solving, as well as activities concerning geometry concepts of pattern, space and shape, measurement and data handling. Such activities should be meticulously planned (DBE, 2011, p. 11). This is an example of how the policy suggests to teachers how to spend their time in the classroom. The CAPS for FP (Grades 1-3) also specifies that learners are expected to "build an understanding of the basic operations of addition, subtraction, multiplication and division" and that "solving problems in context enables learners to communicate their own thinking orally and in writing through drawings and symbols" (DBE, 2011, p. 9).

According to the CAPS policy, numbers are the most important topic in FP mathematics. Significant time each week, term, and year is focused on numbers, operations and relationships. This is one of the main topics in the policy document. The policy document is precise. Time in minutes is stipulated for teaching specific content, including the strategies that should be used for specific content. On average, three or more lessons per week should focus on numbers, number operations and relationships. The remaining time is divided among the other content areas. Space, shape, and measurement require more time and attention than data handling and patterns, functions and algebra (DBE, 2011, p. 11). Therefore, as the exit grade is Grade 3 in the FP, the rest of the chapter will discuss the policy guidelines for Grade 3 to highlight how the policy that is to be implemented in the earlier grades and their time allocations prepare the learners for the higher volume of work expected in Grade 3.

2.3.1. CAPS for Grades 1-3 Mathematics Policy Guidelines and Time Allocations

In Grades 1-3, numbers, operations and relationships are the main focus of mathematics (DBE, 2012). Learners need to exit FP with competent number sense and confident operational fluency. Learners to be competent and confident with numbers and calculations. It is for this reason that the notional time allocated to number operations and relationships has been increased. Most of the work on patterns should focus on number patterns to consolidate the learners' number ability further (DBE, 2011). According to the policy, the time for Grades 1-3 has been allocated in the following way:

- Seven hours are to be used for mathematics per week (10 weeks x 4 terms x 7 hours = 280 hours per year).
- Every mathematics lesson should be 1 hour and 24 minutes per day.
- This then means that there approximately 200 lessons made up as follows: four terms of 10 weeks with five daily (Monday to Friday) lessons per week.
- At the start of each term a week is allowed for orientation and consolidation since young children tend to forget a lot of content during the holidays, and they also need to acclimatise themselves to the rhythm of schooling. For the consolidation of concepts, a week is also allowed at the end of each term (DBE, 2011, p. 36).

A daily activity for the FP is the counting of objects and numbers. Grade 1 learners should be able to estimate and count to at least 50 everyday objects reliably. Counting by grouping is encouraged (2, 4, 6…) Learners have to count forwards and backwards in ones from any number between 0 and 100. They are required to solve word problems in context and also to explain their solutions to problems. These word problems involve operations of addition and subtraction with answers up to 20. Grade 2 learners should estimate and count to at least 200 everyday objects reliably, including counting by grouping, which is encouraged just as it is for the other grades. Just like in Grade 1, these Grade 2 learners should also solve word problems in context and explain their solutions to problems involving addition and subtraction with answers up to 99 (DBE, 2011). This is just one example of how the policy suggests the concepts in FP are to be taught. Each grade is given these guidelines for all the concepts in mathematics. The workload continually increases from Grade 1 to Grade 3, with Grade 3 having the highest and most intense workload.

Grade 3 is considered one of the most important grades in the schooling system as it is an exit grade of a phase. At the end of the grade, learners should have mastered the foundations for all subjects taught, namely, the four core subjects: Home Language, First Additional Language, Life Skills, and Mathematics. The CAPS for Grade 3 mathematics stipulates time allocations for each concept. Educators are expected to draft their classroom timetables according to these guidelines. The content is broken up into the following main concepts: numbers, operations and relationships, patterns, functions and algebra, space and shape (geometry), measurement and data handling (DBE, 2011). These content areas have specified weightings indicating how much they contribute to a learner's performance. The weightings also directly influence the amount of time dedicated to each concept.

Table 2.2: *Weighting of content areas in mathematics for Foundation Phase* (Adapted from DBE, 2011, p. 10)

Weighting of Content Areas			
Content Area	Grade 1	Grade 2	Grade 3
Numbers, operations and relationships*	65%	60%	58%
Patterns, functions and algebra	10%	10%	10%
Space and shape (geometry)	11%	13%	13%
Measurement	9%	12%	14%
Data handling (statistics)	5%	5%	5%
	100%	**100%**	**100%**

This table displays the percentages of the weighting of the concepts for Mathematics in Foundation Phase. The higher the weighting of the specific content area the more time a teacher has to spend teaching that concept since it will make up the majority of the questions in assessment (DBE, 2011). For example, more time has to be spent on numbers, operations and relationships since it has the highest weighting. However, other concepts may be more difficult and require a substantial amount of time as well.

In comparison to the other two grades, Grade 3 learners should estimate and count to at least 1000 everyday objects reliably, which is substantially more than the two previous grades. They should solve word problems in context and explain their solutions to problems involving addition and subtraction with answers up to 999. This is much higher in comparison to Grade 2, where learners only need to solve problems up to 99, which reflects a big jump in content knowledge from the previous grade. However, this significant increase in content requirements has to be considered in relation to the two-hour difference in the time given to Grade 3 learners for mathematics. The learners are expected to do more work and learn more within the additional two hours teaching time per week (DBE, 2011).

The three critical aspects to mastering FP numeracy are: progression in acquiring the number concept, the shift from concrete to abstract reasoning, and relatedly, the move from counting to calculating (Ensor et al. 2009). All of these aspects need repetition and enough time to grasp what

is taught. However, CAPS leaves little room for adjustments or additional work. The exact amount of time that should be used for each concept is stipulated and no remedial or reinforcement time is allocated, however there are guidelines on how to make adjustments for learners with barriers to learning (DBE, 2011). For learners struggling to grasp a concept and requiring more time spent on that concept, teachers have to use their discretion and not necessarily follow the curriculum guidelines on time.

A study conducted in Chicago's elementary schools by Smith, Smith and Bryk (1998, cited in McDonnell, 1995, p. 308) suggests that Opportunity to Learn (OTL) is defined "not only by the curriculum content that learners are offered and the amount of contact time devoted to teaching the subject area", but also by the sequencing and pacing of curriculum content that is made available to learners (Smith et al., 1998). This simply means that no matter how well structured and organised the curriculum may be, the time devoted to teaching has to be sufficient to ensure that learners actually grasp the concepts that they are taught. Teachers also have to ensure that they use the time given to them to teach content effectively and make sure that they relay the information successfully to the learners they are teaching.

2.4. Policy, Time and Classroom Pedagogy

Policy, time and pedagogy must all be considered together when planning lessons for learners. Time is drafted in policy; policy is used in order to plan lessons, and this determines the pedagogical practices that will take place within the classroom environment. These are thus the main contributors in planning and implementing the curriculum. According to Christie (2006), concerns in policy in South Africa arise in the implementation process. However, this is not entirely true as the curriculum known as OBE caused significant controversy. It was considered difficult to implement and monitor (Msila, 2007). The implementation of the curriculum is the most crucial aspect of teaching. Therefore, it can be an easy task to plan for lessons as the current CAPS policy is filled with specific guidelines for teaching, but the implementation might be challenging as long the different contexts are not sufficiently catered for. For example, time can be classified through measurable quantities and considered unlimited, homogenous, continuous, unchangeable, invisible and infinite (Aveni, 1993). Yet, in South Africa, educators have to treat time as a resource that has to inform teaching and learning in similar ways even though relaying information to the learners in different classrooms has proven to be a challenge because policies lack guidelines on how to implement this time in practice (du Plessis, 2013, p. 69). Therefore, since the content and concepts taught at the FP level are foundational, a clear explanation of the

link between policy expectations and the stipulated time is crucial to ensure successful learner performance irrespective of context.

Teachers are often required to implement externally formulated policies that overlook their viewpoints and the specific classroom context in which they have to be implemented, thus intensifying the already challenging nature of curriculum implementation (Carless, 2003). This is especially so for primary school teachers, who were educated and trained under the 'old' system and are now required to teach according to the 'new' system which deals with specific attainment targets across a range of subjects. These teachers face public scrutiny for incorrect procedures, despite not being trained in their application (Bennett et al., 1992).

The formulation of the CAPS policy, like many other South African policies, was influenced by policies from countries around the world. The Council for Quality Assurance in General and Further Education in Training (UMALUSI), has tried to improve the curriculum processes through comparative study of South African FP curriculum with other successful international curricula, namely Canada, Singapore and Kenya. The comparison focused on aspects such as the aims, organising principles, content and skills coverage, time allocation, sequencing, pacing, progression, teaching approaches, assessment integration, and the use of the curriculum documents (du Plessis, 2013). A curriculum which lacks integration, is more aligned to traditional methods and is subject based as is the case in Kenya and Singapore. However, as example, the Kenyan curriculum offered specific requirements and provided regulation when compared to the South African where more details are provides on knowledge specification focusing mainly on content) rather than how it is to be regulated as well (UMALUSI, 2011).

Both Canada and South Africa stressed integration and employed an outcomes-based framework, but in different ways. The South African curriculum emphasised skills and generic learning skills, while the Canadian curriculum specified skills, but provided detailed content specifications through concept overview maps, assessment indicators, and performance standards (du Plessis, 2013). The South African curriculum lacked coherence and sufficient theory as regards curriculum design including the pedagogical approach or set of pedagogic principles that are likely to be recognised and understood by teachers within their particular social and historical content (du Plessis, 2013). In short, "the NCS did not represent a curriculum that the average South African teacher would be able to use easily" (UMALUSI, 2011, p. 46). As a result, the teachers are not following what the policy proposes. Rather, they are using documents supplied from their districts known as "curriculum coverage tools", which focus on the guidelines of that specific document (Long & Dunne, 2014) and use them to make sure all indicated topics

are covered. However, Long and Dunne (2014) have pointed out that the manner in which the work is presented is not necessarily up to standard. Conversely, the blame could be put on inflexible guidelines the teachers have to follow in the classroom. The curriculum guidance documents basically suggest what to do, when to do it, and how it should be done.

Mathematics achievement, according to Fleisch (2008), is determined by how well school children are taught to read and to do mathematics. What teachers and learners do in school classrooms also depends on various factors, such as the teachers' views of their learners' capabilities and their understanding of what the official curriculum requires of them. The next chapter discusses these aspects in detail to provide a framework for exploring how FP teachers understand and translate the time stipulated in the CAPS as an aspect of the rules that need to be considered to ensure effectiveness when teaching mathematics.

Chapter 3: Teaching and learning as social activities

3.1. Introduction

This chapter draws on knowledge from various theorist such as Lave, McIntyre and Bernstein in an attempt to outline the theoretical framework of this study which emphasises inter-subjectivity as a significant aspect of social time. A focus on Lave's (1996) study on apprenticeship tries to explain how various learning can take place when an individual is engaged in one activity over a long period of time. The theories discussed are further clarified by drawing on the ideas of Bernstein (2000) on the pedagogical device to underscore the importance of the various rules he writes about and highlight their relationship to MacIntyre's concept of virtuous practice. Furthermore, a discussion of MacIntyre's' notion of virtuous practice is discussed to highlights the importance of following rules if the requirements of standards of excellence are to be met. These are rules that should result in the understanding of the essence of the content taught, that is, what MacIntyre describes as the achievement of the internal goods of a practice.

3.2. Lave on Apprenticeship

Lave and Wenger (1991) have argued that wherever people interact for considerable periods of time, for example, daily doing things in which their continuing activities are interdependent, learning becomes part of their participation. It is experienced as a social and collective effort, rather than only as an individual and psychological phenomenon. As Lave (1996) suggests, learning cannot be subjected solely to the classroom environment. It can be informal and take place wherever an individual spends long periods of time, which includes day-to-day practices. In his view, an individual's learning is influenced by immediate communities and individuals who make up these communities. Therefore, it (learning) is a facet of the communities of practice which embody beliefs and behaviours within a culture and the individuals that are part of such learning.

In Lave's (1996) view, learning involves participation in socially situated practices. This understanding of learning as a social practice was developed from his research on Vai and Gola tailor apprenticeships in Liberia, in West Africa. Through inquiring into what was being learnt by the apprentices and whether the mechanical reproduction of skills in making trousers would be the only outcome of years of apprenticeship, Lave found that the apprentices were learning many complex lessons at the same time. Other important life lessons were learnt that could be considered more important than the tailoring aspect of the apprenticeship. For example, within the clothing industry, they were learning relations among the major social identities and divisions

in Liberian society. They were also learning to make a living, manufacture clothes and grow mature enough to become master tailors and subsequently experience respect as masters of the trade (Lave, 1996). He thus argued that the characteristics of apprenticeships among the Liberian tailors did not match claims about the nature of informal education.

According to Lave (1996), teaching is neither necessary nor enough to produce learning. It (learning) occurs normally, through an activity, within a context and culture and unintentionally rather than deliberate as in teaching in a formal school setting. His argument is that the social-cultural categories that divide teachers from learners in schools confuse the crucial ways in which learning should take place because social interaction in a situational context promotes collaboration, which in turn, engenders learning, which encompasses not only concepts but behaviours and beliefs. The 'informal' practices through which learning occurred in apprenticeships were robust and forceful. Therefore, the way we conceptualise teaching must be re-thought based on a perspective that takes learners and learning as the fundamental aspects that it (teaching) may or may not be a part of.

The conclusion raises questions about the effectiveness of standard 'formal' educational practices in schools because distinctions between the rational knowledge content attributed to the school 'curriculum' and the broad moral focus assumed for 'informal education' do not take into account the skills and moral content of schooling and the knowledge that is part of all pedagogic practices (Lave, 1996). First, knowledge conveyed to individuals in the schooling system is restricted and relates to a specific way of thinking. It is standardised, and every individual who is part of the system learns in a context-bound environment, according to Lave (1996). This schooling environment is guided by specific rules which govern many aspects of individual behaviour. For example, in South Africa, the CAPS curriculum stipulates rules that have to be followed by the educators when preparing lessons and teaching to ensure that the set outcomes are achieved by all the learners irrespective of their abilities and contexts in which they are taught. The rules are also meant to assist educators in preparing the learners for the standardised assessments, to perform well and achieve the desired results. For example, for a subject such as mathematics, the concepts and skills learners have developed in their daily lives such as counting money that needs to be paid when at a shop and ensuring that the correct amount of change is received, are usually overlooked despite the guidance in CAPS. Therefore, drawing on Lave (1996), it is important that these concepts and skills be considered beneficial to learning for it to be meaningful to the learners beyond the classroom environment.

According to MacIntyre (1981) too, meaningful learning is situated in practices that are methodical and complex forms of socially established cooperative human activity. It is within a culture or community, where standards of excellence, obedience to rules, and achievement is aspired to. He suggests that the rules and standards are historical and should, therefore, be considered compulsory, prescriptive, and non-negotiable. Individuals who partake in learning in an institution should be made aware of what is expected of them from the beginning. They should know that they are expected to follow the rules of an institution and by following these rules, they will achieve the set outcomes. They should also be made aware of the roles that others play in these settings, for example, figures of authority who are considered seniors of the practice. They have to accept the authority of these seniors as they guide them in the learning process and accept them as individuals who help ascertain what is considered the goods of practice (MacIntyre, 1981).

3.3. MacIntyre on Virtuous Practice and Bernstein on Pedagogical Discourse

MacIntyre (1981) discusses two types of goods which are gained in practice, namely, internal and external goods. Internal goods are related to achievement and external goods to possession and thus property that could be acquired. In order to acquire internal goods, virtues are considered an important aspect and require participants to be obedient to the rules in order to achieve the set standards. The latter usually involve competition where winners and losers could be identified.

According to MacIntyre, obedience to the rules and figures of authority can lead to the attainment of external goods, for example, prestige events such as awards and trophies, a certain status, or a learner being a top performer, as rewards. However, such attainment could, in turn, affect the ability to attain what MacIntyre identifies as internal goods, which are achievable from relationships or various kinds of intellectual stimulation derived from the exercise of virtues associated with achieving excellence (MacIntyre, 1981). In short, classroom pedagogy and the way in which knowledge is conveyed from the teacher to the learner, how interaction takes place in the classroom environment, and how individuals conduct themselves are crucial to virtuous practice which is likely to make standards of excellence accessible to those who are taught.

In discussing a similar viewpoint, Bernstein (2000) emphasises the importance of relations within knowledge. Instead of simply showing how knowledge shapes identity, he explains how it (knowledge) specialises identity, consciousness and relations, that is, how the structuring of intellectual and educational knowledge specialise actors and discourses in ways that shape social relations, institutional organisation, disciplinary and curricular change, identity, consciousness and habitus (see also Singh, 2002; Moore, 2004).

For Bernstein (2000), the language device and what he calls the pedagogic device is important for structuring the communication of knowledge. In his view, the pedagogic device occurs at a social level and is independent of cultural influences. Bernstein suggests that this device involves collective methods and strategies through which knowledge is converted into pedagogic communication. It has internal rules which regulate the pedagogic communication that makes the device possible. It is through the pedagogic discourse that the meaning is managed and, in turn, the intrinsic grammar of a pedagogic discourse can be restricted or enhanced. For example, mathematics has specific mathematical terminology which is used alongside specific teaching strategies. Learners have to understand what this terminology means within mathematics as a subject. However, without the appropriate pedagogical communication or teaching strategies, that is, the language used, as an important facet that has to facilitate understanding of the subject content of mathematics, the language will either enhance or impede learning.

Bernstein (2000) argues that, at the most abstract level, the pedagogic discourse specialises time, text, and space and these aspects all have a special relationship with one another. The discourse specialises meanings to time and space which, in turn, affects cognitive, social, and cultural elements of education. The different rules of the device have to be considered in the selection, transmission, and evaluation of knowledge.

Bernstein has identified three interrelated rules which govern the pedagogic discourse, namely, distributive rules, recontextualising rules, and evaluative rules (Bernstein, 2000). The distributive rules are there to manage the relationships between power, social groups, forms of consciousness, and practice. These groups are usually stratified, and knowledge and rules are passed down this stratification and ultimately on to the learners. How and what types of knowledge are communicated are ultimately determined by these structures (Bernstein, 2000). In the schooling system the policy is drafted by policy makers and then has to be interpreted by the educator who imparts this knowledge to her learners. The recontextualising rules therefore manage and regulate the formation of particular pedagogic discourse. This is determined by rules which create specialised communication through which pedagogic subjects are chosen and created through contexts and content. Through the process of recontextualisation, knowledge becomes appropriated, and this is a crucial function for the independence of education. The recontextualising rule not only selects what is taught but how it is taught through instruction, it is also an important element of regulative discourse structures (Bernstein, 2000). Therefore, teachers have to be able to represent the subject content in ways that will accommodate the learners' learning styles without distorting its essence. Therefore, although pedagogy has to

consider the curriculum policy and learners' needs, these aspects cannot be addressed through using discourses that overlook established ways of communicating particular subject content.

Bernstein (2000) identifies two types of pedagogical discourses, namely the instructional and regulative discourses. Regulative discourse is considered dominant while instructional discourse is entrenched in regulative discourse. The instructional discourse includes the rules that generate skills that should be distributed to learners in a schooling environment. Regulative discourse has rules generated within instructional discourse which are there for the transmission of these skills. In classrooms, all pedagogic discourse creates a system of regulation on a social level for the transmission and acquisition of rules which influence behaviour. This determines the moral order and the transmission of the instructional discourse (Singh, 2002).

Lastly, we have the evaluative rules. These rules help to transform discourse into pedagogic practice. Since the discourse takes place within a set time and affects the way individuals interact with one another, this interaction is given meaning through the manner in which these interactions take place, and this is determined by the pedagogic style. Furthermore, a text is converted into content and space is converted into a specific context, as these are crucial features for communication. Therefore, we can identify that the success of pedagogic practice is possible through constant evaluation. Evaluation connects the meaning of the entire device, and we are now able to develop the purpose of the device, which is to identify the symbolic elements behind the device (Bernstein, 2000). It is in this sense that the pedagogic device helps in deciding on what text to use and who should communicate it, to make it attainable in the classroom. It assists the teacher in determining the potential discursive gap in what the learners know and can do and establish ways in which such a gap can be closed. Any pedagogic discourse will thus interrupt time and alter it.

Therefore, texts used for evaluating or assessing learners cannot be chosen arbitrarily. They have to reflect a discourse that belongs to the content that is assessed. This is a crucial feature for its communication. Only when this is in place can evaluation or assessment connect the meaning of the content with the device used for communicating content, that is, reflect appropriate symbolic elements of the assessment behind the device (Bernstein, 2000). It is in this sense that the evaluative rules helps in deciding on how to structure texts to be used for evaluation or assessment. In this regard, learners 'individual orientations would be overlooked when evaluating their performance. Educators have to make sure that learning is judged based on texts communicate with an appropriate discourse.

A precise, cogent, systematically principled and hierarchical organisation of knowledge, which progresses through the integration of knowledge at lower levels and across a widening range of phenomena is described by Bernstein (1996, pp. 172-3) as hierarchical knower structures. The structures possess a systematic principle for selecting and arranging role-players (teachers and learners) and discourses into a hierarchical structure. Within intellectual fields, these individuals and discourses are recontextualised into positions which is why teachers are considered figures of authority and learners have to accept the authority bestowed upon them within the field of knowledge. The authority is based on principles which originate from the knowledge structure and the knower structure (Singh, 2002). Therefore, to fully understand intellectual and educational fields, it is necessary to bring these together and think in terms of *knowledge-knower structures*. Together, they define the basis of specialisation for individuals and the discourses within fields that assist in shaping relations in pedagogic practices, including identity and consciousness (Maton, 2007).

3.4. Conclusion

Drawing on the discussion above, it is reasonable to conclude that each lesson has to be viewed as having rules which need to be followed. For example, for a subject such as mathematics, for each concept to be taught, there will be rules and methods which need to be followed to enable the learners to grasp that concept. Overlooking these rules, which govern the teaching of various concepts and the behaviour or classroom interactions, could lead to negative learning outcomes. Once these rules are followed, learners are likely to understand, and learning becomes more structured and coherent. Specifically, mathematics learners will identify themselves with what they are being taught and conduct themselves in a way suitable or appropriate for learning mathematics. The language used in the classroom will be mathematical, and learners will assume specific roles that will be necessary to shape their mathematical identity. They have to understand what is expected of them and subject themselves to it in order to achieve internal goods associated with standards of excellence for the subject. These aspects have to shape the classroom pedagogy and discourse used in mathematics lessons if the desired learning and results are to be achieved.

Implied in the interactions that characterise such pedagogy and discourse is the concept of inter-subjectivity, which is both experience-related and relational, according to Jaworski (2015). Its central constructs seek to conceptualise the organisation of personal experience and its variations within an ongoing system. For MacIntyre (1981), this is a system governed by rules through which virtuous practice can be achieved and for Bernstein (2000), it is the interactions that connect the

symbolic elements or meaning behind the pedagogic device. For these reasons, the time stipulated in the CAPS document cannot be seen only as chronological time, even though it refers to important chronological elements as regards the pacing and sequencing of topics from grade to grade in FP and from Term 1 to Term 4 of each grade including Grade 3 which is the focus of this study. The time has to be understood as denoting specific instances that have to characterise fleeting moment within lessons that Aveni (1993) describes as measured intervals between events. These are events that would be reflected as the relations and interactions taking place between the teacher and learners and amongst the learners themselves. Therefore, in addition to the sequence of events used by the teachers to close the discursive gap identified between what the learners know and understand and what is taught, interactions and dialogue during lessons are crucial for communicating the standards of excellence stipulated in the CAPS presented as the outcomes which learners are expected to achieve with a topic or concept taught for a specified time. The relations and interactions targeting the gap between what the learners know and what is taught will, according to Lave (1996), has to be used to guide learners and make them full members of a community of practice over time, or in Maton's (2007) view, possessors of an elite code.

Time as social time is an important aspect of curriculum and effective teaching and learning. More important is how it is used to create a context or environment that will be conducive to such teaching and learning. The next chapter explains the methodology that was used to study the pedagogy and discourses that were used to meet the requirements of the time stipulated in CAPS for Grade 3 mathematics lessons; specifically, how the interactions and dialogues used affected the quality of lessons and, subsequently, the performance of the learners.

Chapter 4: Methodology

4.1. Introduction

In this chapter, the research design, approach, sampling process, data collection tools, research process and data analysis are discussed to clarify their significance in assisting to examine the unit of study identified, (pedagogy as interactions and dialogues used to teach), in chapter three.

The discussion highlights how in examining inter-subjectivity as a crucial element in how Grade 3 mathematics teachers used the prescribed time in the CAPS policy, the methodology used helped to expose how, amongst other devices, they mainly recontextualised what they taught. Of particular interest was how well they interacted and communicated with the learners when dealing with discursive gaps or difficulties in grasping concepts and how they used mathematical language to close this gap.

4.2. Research Design

Dornyei (2007, p. 126) explains that qualitative research "focuses on describing, understanding, and clarifying a human experience." Its focus to collect and acquire insight from individuals into an issue that is being researched in order to gain greater knowledge and insight, rather than to study a group of individuals who would function as representatives of a population or phenomena.

In education, qualitative research is applied to investigate on a small scale; therefore, it is chosen to explore details about human behaviour, patterns, and beliefs (Scott & Morrison, 2006) of the educators and learners' experiences of time usage in the classroom. The interactions between learners and teachers were observed in the mathematics classroom to establish how they reflect the translation of the stipulated time into classroom pedagogy. Thus, the relations and interactions between the teachers and learners and the sequence of events followed by the teachers to close the learners' discursive gap were studied. The behaviour and patterns during lessons need to be clarified to determine how the teachers translate the stipulated time into social activities in the classroom setting.

4.3. Research Approach

A phenomenological approach was used in the study to study the teachers' pedagogic practices in relation to how they use time in the classroom environment for Grade 3 mathematics lessons. The assumption is that, since the time, curriculum, and pedagogy in their practices are interlinked, focusing on time would uncover teachers' understanding of the significance of the stipulated time in CAPS in the planning and teaching of mathematics lessons.

Lave (1996) states that learning is situated in experiences that individuals are embedded in for long periods of time. Since there are rules which specifically regulate practices within classrooms, as pointed out by MacIntyre (1981) and Bernstein (2000), they constitute standards of excellence that have to be obeyed. Achievement is only attainable if these rules are observed and obeyed.

In the study, it was important to observe and understand how the teachers were able or not able to use the time as social time in facilitating such achievement.

This reality is considered inter-subjective. The phenomenological approach was thus used in this study (Maree, 2010) to look at the ways in which educators use time in the Grade 3 mathematics lessons and as their reality lived at classroom level. Therefore, examining it as their unique experience (Creswell, 2009), helped to clarify how they understand the time stipulations they are expected to follow for each mathematics' topic in CAPS. They are directed by strict and specific guidelines that they cannot overlook. The phenomenological approach compels one to disregard one's own experiences in order to understand those of the participants in the study (Creswell, 2009). This enables the researcher to get an in-depth look at teacher practices by closely observing their behaviour with the learners, as well as the content for mathematics within the stipulated time of CAPS.

4.4. Research Methods and Process

The study used classroom observations and interviews to obtain data. The researcher observed a mathematics lesson for each Grade 3 educator and, thereafter, the educators were interviewed one-on-one.

4.4.1. Observations

Mackay and Gass (2012, p. 141) argue that observations are often used in addition to teacher and student interviews in order to monitor the students' and teachers' perceptions of what is transpiring in the classroom. In this study, the participants were observed in their natural environment in order to capture how the time stipulated affects classroom pedagogy.

During classroom observation, the researcher was seated quietly at the back of the classroom. The researcher made use of a pre-prepared observation sheet to record observations of the specific relations, interactions, and sequence of events that took place between the teacher and the learner. The teaching methods that the different teachers used and how learners responded to these methods were of particular interest. It was interesting to observe how the teachers distributed, recontextualised, and assessed what they taught; how well teachers knew which learners were experiencing discursive gaps or difficulties in grasping concepts; and how they used mathematical language to close this gap.

4.4.2. Interviews

Interviews were chosen to collect data because they are suitable for topics that are personal or may evoke negative feelings because the person feels strongly about the topic. Interviews also have a higher response rate in comparison to questionnaires (McMillan & Schumacher, 2010). In addition, they are useful because the interviewee's responses can be probed, clarified, and elaborated upon. Non-verbal behaviour can be noted during the interview, and there is opportunity to motivate the respondent. Because interviews can be recorded, the researcher can listen to the responses as many times as needed and does not have to rely on the memory of the interview, as some important data may be lost in that way. In addition, in this type of primary data collection, the researcher has direct command over the proceedings as it flows and a chance to clarify issues during the process if needed (Creswell, 2009).

Since the study aimed at capturing teachers' classroom practices, which are subjective and personal, the teachers were best engaged with during extended one-on-one and face-to-face discussions. This was done by asking probing open-ended questions and allowing educators to elaborate on and express their own views about the matter at hand. This was also the modus operandi so that the teachers would feel free to answer openly and honestly with no other individuals present so that there was complete privacy and no influence from other individuals.

4.4.3. Sampling

The sampling method was purposive and focused because the selection was theoretically informed according to who was to be included in the sample (Scott & Morrison, 2006). Purposive sampling is a technique in which the researcher relies on their own judgment when choosing members of the population to participate in the study and is in a position to discard irrelevant information that does not pertain to the topic (Creswell, 2009). Its main goal is to focus on certain characteristics of a population that are of interest and which will best enable the researcher to answer the research questions. Units are selected based on similar characteristics of interest to the researcher (Creswell, 2009).

The sampling was purposive because it focused on educators with extensive experience in teaching Grade 3 specifically. These teachers had also taught mathematics to Grade 3 learners for many years. The sample selected was from a specific population. Therefore, the population was from one school and was focused on educators teaching Grade 3 mathematics during the year the study was conducted, as they were more likely to answer questions about mathematics

and the stipulated time as they were currently teaching it. According to Bernstein (2000), the most abstract level of pedagogic discourse specialises in time, text and space, and these aspects all have a unique and particular relationship with one another. By selecting specific teachers who are at the centre of teaching, the researcher was able to identify how they conduct themselves in the classroom space in which they have spent so many years and the challenges that they encountered and still encounter.

To select the teachers, non-probability sampling was used because not everyone had an equal chance of being selected. Non-probability sampling is a sampling technique where the samples are selected which uses the subjective judgment of the researcher rather than random selection (Creswell, 2009). The teachers were chosen because they have extensive experience in teaching Grade 3, taking into consideration that they are also teaching mathematics during this period.

Four teachers from a school in a southern suburb of Johannesburg were sampled. Each teacher had between five to ten years of experience teaching Grade 3 in the FP. The assumption was that they would be able to translate the prescribed time in CAPS into practice more effectively because of their professional experience. They were also expected to be familiar with the policy. All the teachers were female. The FP teaching field is dominated by female teachers. This is because males consider teaching more senior learners as more masculine and as having a higher intellectual status, thus there is a low number of male teachers in foundation phase (Bhana & Moosa, 2016).

The study was conducted in one public school in the south of Johannesburg because it is in the vicinity of the researcher's workplace. This also made the sampling process more convenient (Creswell, 2009).

4.4.4. Data analysis

Qualitative analysis transforms raw data into findings and knowledge (Patton, 2002). Data analysis was conducted through the examination of the content obtained from the interviews and observations. Thematic content analysis was applied. According to Anderson (2007), thematic content analysis is a descriptive presentation of data in which the researcher attempts to identify the common themes in the texts provided.

To conduct the thematic content analysis, six steps were followed, as suggested by Braun and Clark (2006). The first step was to become familiar with the content of the transcripts after the interviews had been transcribed. To do this, the transcripts had to be read, and the audios had to

be listened to. At this stage, notes on the initial ideas gathered from the data were made and divided into smaller groups according to meaning using the inductive method. The notes taken during the lesson observations were transcribed by first making notes of all the important points listed. The researcher listed both the differences and similarities in the practices of all educators who participated in the study and then drew out the main codes from them (Patton, 2002). This was followed by looking at the research questions and grouping similarities and differences in the answers provided in line with the research questions. For example, all the teachers used learner engagement by allowing learners to write answers on the board, and this was identified as a type of teaching strategy which was coded thematically. The teachers also complained about not having enough time to use specific teaching strategies which they considered fruitful to their teaching, and this was identified as another code.

The second step was to categorise the identified codes. The codes were organised systematically through comparison to uncover patterns (Henning et al., 2010). For example, by looking at patterns in teaching methods, 'carpet teaching' was identified as a category during the observations conducted. This strategy was used by three of the four teachers observed. In this method, teachers made the learners sit on the carpet, which is directly in front of the blackboard, and taught them a concept until they were confident that they understood the concept after inviting them to write answers on the board.

The third step was to group the categories and develop themes. This was done by grouping categories noted from the observations and those that relate to the data from the interviews, which combined the two sets of data to draw out one main theme. At this point, the initial themes had to be combined, refined, separated or disregarded to ensure that the data and the themes cohere in meaningful ways. Different types of engagement strategies were used, such as learners writing on the boards, and allowing learners to demonstrate understanding by means of concrete objects. These were all grouped under the main theme of 'teaching strategies'. Other strategies were mentioned or witnessed, but they were not all at a substantial level and were therefore, discarded. The next step was to rename and define the themes and then use them to organise the presentation and analysis of the observation data with extracts from the interview transcripts.

4.5. Ethical Considerations

Research in education investigates people and therefore ethical considerations will always be present. This is especially the case for qualitative research as qualitative methods often target people's opinions and views as opposed to quantitative research (Dornyei, 2007, p. 63). Ethics

can be described as norms or standards for conduct that are used to distinguish right from wrong. (Henning et al., 2010). This code of ethics is necessary as it helps to determine the difference between acceptable and unacceptable behaviours. The ethical standards further assist to prevent the fabrication of data and encourages and promotes the search for knowledge and truth, which is the central and foremost goal of research (Creswell, 2009). Ethical behaviour contributes and encourages an environment of trust, mutual respect, and accountability, where the participants may communicate sensitive information, and it may be harmful or difficult for them. It often poses a dilemma if the researcher includes such information in the study.

In this study, the teachers were contacted by visiting the school and then dates were set up for when they would be interviewed and observed. The participants were informed in writing about the research and they consented by signing a document according to the requirements of the study. The document stated that the participants had the prerogative to withdraw from the research at any time, should they wish to. The researcher obtained informed consent from the school as well as the participating teachers. The researcher used the consent form provided by the university with the ethical guidelines therein. The researcher sat with each participant and went through the document thoroughly so that they understood the research and the questions involved (Creswell, 2009).

Participants were informed about their right to privacy, that their identities would be protected, and about how the information obtained through the recorded interviews would be utilised (Henning et al., 2010). The purpose of the study was explained to the participants in detail as well as the methods used to retrieve the information from each participant, including the timeframe. According to Henning et al. (2010), anonymity is essential, and the researcher should ensure that the signed consent forms are treated with the utmost discretion. The researcher made it clear that the participant is not forced to partake in the study and is able to withdraw from it at any time. If requested, they may read the research once it is complete (Kvale, 1999).

The various categories and questions in the interview guides did not, however, pose any questions that might be considered intrusive or sensitive. This is because the main focus of these questions is not personal but instead based on teaching and learning. They do not focus on the teacher's personal well-being or are intrusive in any way. Questions are more focused on curriculum time and pedagogic practices in the classroom environment. This is because the study is concerned mainly with the curriculum and the time stipulated in policy.

4.5.1. Trustworthiness and dependability

An evaluation of the quality of the research is necessary, especially if findings are to be utilised in practice. Assessing the trustworthiness of the findings of a study requires researchers to make judgements about the soundness of a study with regards to the methods utilised and the integrity of the final conclusions (Noble & Smith, 2015). This is because qualitative research is constantly being criticised as lacking scientific firmness and transparency in analytical procedures. Thus, researchers of qualitative studies are under more pressure to present their findings in the most accurate way possible and to conduct extensive analyses of collected data.

Trustworthiness thus concerns itself with four standards namely: credibility, dependability, transferability, and confirmability (Guba, 1981). The credibility of the study seeks to ensure that the study tests what it is intended for. Therefore, when collecting qualitative data, it is the researcher's responsibility to be as thorough as possible and to pay attention to detail when selecting methods of data collection that are specifically aligned with their study.

In light of the above discussion, the study used two different methods of data collection in order to strengthen the findings of the study. The interviews were complemented by observations to support the development of themes and the credibility of the study. The dependability of the study could be compromised, and generalisations could be made based on the fact that all participants originate in one school, and the population size consists of a small group of four teachers (Shenton, 2004). Transferability of the study is possible as a small population group was the focus of the study and it was done over such a short period of time, however the study could be conducted on a larger scale over a longer period of time in order to obtain a broader more detailed array of results (Shenton, 2004).

Confirmability is dependent on the researcher's ability to focus on the participants' narratives and words and try to remain as objective as possible in order to avoid any potential biases (Shenton, 2004). For this particular study the researcher focused on the response from the educator's interviews and classroom observations to present the findings as they were.

Chapter 5: Data Presentation and Analysis

5.1. Introduction

This chapter presents and analyses the data collected to answer the questions posed in the study. The theoretical framework adopted for the study is drawn on to make sense of the data and highlight its conceptual implications when viewed against the practices of Grade 3 mathematics teachers who participated in the study. Pseudonyms are used for all these teachers.

Two main themes are used to organise the chapter, namely, CAPS as a curriculum guidance document and a metaphor of pedagogy as carpeting. Under each theme, a sub-theme is also discussed. For example, in relation to the CAPS, data on the CAPS as a curriculum guidance document in relation to Grade 3 Mathematics teaching and the time allocated for teaching by the CAPS and, the teachers' use of the allocated time and the pacing of lessons suggested by the CAPS are looked at to establish their implications to the outcomes specified in the CAPS. As regards to pedagogy, the subthemes discussed include the teachers' activities and strategies in mathematics lessons and teachers' curriculum coverage. The issues are examined to reveal how they reflected the teachers' understanding of the significance of the time allocated for teaching specific concepts at Grade 3 level. Finally, the chapter highlights the links between the analysis developed and the general poor performance of South African learners in the earlier years of schooling.

In general, the data indicates that the teachers felt that teaching with concrete objects, for example, using counters, bottle tops, 3D shapes and any other objects that learners could interact with during lessons was useful to the learners. In their view, young learners understood best through sight and touch. Therefore, using more of the learners' senses was helpful. Unfortunately, they were concerned that the teaching strategies required much more time. As a result, they were unable to use the strategies effectively. This they viewed as disadvantageous to the learners. The time stipulated for teaching specific concepts affected their curriculum decision-making processes and how they planned classroom activities and interactions. Their priority seemed to be to cover the prescribed curriculum as expected by the CAPS and other education officials. They felt they had no authority to alter the suggested time and pacing of lessons. As a result, at times they had to move and teach new subject content even though the learners had not fully grasped what had been previously taught.

5.2. CAPS as a Curriculum Guidance Document

The CAPS document stipulates clear guidelines in relation to the content that should be taught, the length of time to use for teaching specific content and the ways in which lessons should be structured per week (DBE, 2012).

In collecting data to respond to the question, 'how do teachers understand and use the time that the CAPS prescribes for Grade 3 mathematics?, it was noted during observations that each educator had a timetable specific to their class, which they had followed daily for all the subjects they taught. When asked how they decided on the timetables, three teachers indicated that they were based on the time stipulated for mathematics in the CAPS for Grade 3. Mrs Ndlovu stated: "I think it's around maybe six hours or five hours, if I'm not mistaken." These teachers also indicated that even though they had they timetables, they at times used their discretion during lessons when teaching. On paper, their planning strictly followed the stipulated CAPS timetable and only deviated from the allocated time when it was necessary to spend more time explaining concepts the learners were struggling to grasp. They would often attempt to use group teaching in order to provide some relief to the learners who had difficulty with certain concepts. For the teachers, it was important that their teaching benefitted every learner they were teaching. Only Mrs Smith seemed unaware of the allocation and stated the following: "I think maybe 4 hours, in the CAPS document, I don't know how much time is stipulated". The following section discusses more responses that the teachers provided in relation to the time allocated for teaching mathematics concepts in Grade 3.

5.2.1. Grade 3 Mathematics teaching and the time allocated for teaching by the CAPS

Mrs Ndlovu (pseudonym) explained that learners' cognitive abilities varied. Some learners grasped certain concepts quicker than others. Therefore, a teacher could spend more time teaching one group of learners while another group would have already grasped the concept. This meant that the pacing of the curriculum depended more on the learners' ability to grasp concepts rather than what the CAPS proposed. She also indicated that she did not follow the timetable but her learners' pace and ability to grasp concepts:

> Since I have said that there are children who work at different paces, there are those children who are very, very slow, and you have to try to also accommodate them. Try to help them, to give them extra time. Therefore, you find yourself unable

to move on to the next subject, even if it is stipulated in the timetable (see Appendix C2).

She emphasised the point as follows:

> I will teach a concept until I am positive that my learners have grasped that concept. If not, I will continue teaching using different methods to explain to ensure that they fully understood what they were taught before moving along or doing the activity in their workbooks (see Appendix C2).

Mrs Ndlovu emphasised the point as follows:

> Sometimes in mathematics there's a lot to do on that day, and I need to really push. So, mathematics will take the time for Afrikaans or Life Skills…, I'll have just a little bit of time. Then, the following day, I will spend more on Life Skills, you see, so that I can catch up on what I have missed. Therefore, I don't really follow the school timetable (see Appendix C2).

During the lesson observations, it became clear that in trying to make her teaching effective, Mrs Ndlovu used various examples and strategies. For example, during one lesson observation (6th May) Mrs Ndlovu took into account her learners' abilities and prioritised their needs over the stipulated time. She gave learners who took longer to grasp concepts more attention than the others because of her deep empathy. She would allow the other learners to complete the tasks in their workbooks while she continued to explain the concepts to those who had difficulty grasping them. She explained the concepts several times using a variety of examples and teaching strategies, asking them questions until she felt that they understood the concept.

She spent more time on problem solving and randomly asked the learners to walk to the front and write the answers on the board to make them pay attention in the lesson. The learners were only allowed to complete the tasks for that day when she became confident that they fully understood what was taught. She also would restructure the activity to accommodate them. Instead of giving the learners ten sums like the others, she would only assign five. As she put it:

> I allow the learners to write answers on the blackboard. This ensures that they are alert and attentive in the classroom because they never know who I will ask to go to the front and write down their answers (see Appendix C2).

After the lesson, she explained that, in her view, the CAPS does not make allowance for time needed to address different learners' cognitive abilities. She also pointed out that in previous

professional development courses she attended, the facilitators indicated that teachers may adjust the work suggested for the learners but not the time allocated to it. They advised the teachers that, for example, a learner who needed more time to complete work may only be given five sums out of the suggested ten.

Mrs Ndlovu's teaching can thus be seen as reflecting her understanding of the significance of the time stipulated in CAPS. This time had to be the gist of everyday classroom life (Cipriani, 2013) for her. However, she seemed not to have understood it as 'social time' that needed to be observed to meet the standards of excellence set for different topics. In her mind it was possible to be flexible and accommodate the weak learners without thinking of whether or not she was overlooking important rules that were crucial for determining competence at this level of schooling. In her view it was important that FP teachers should teach classes and not lessons/subjects and have more freedom to teach a topic or concept using a variety of 'concrete' aids until the learners provided the expected responses. She acknowledged that such adjustments of instructional time were difficult in the Intermediate and Further Education and Training (FET) phases where specialist teachers teach across grades and instructional time is controlled strictly.

Mrs Ndlovu was no exception. Other teachers in the study also exceed the recommended time for teaching mathematics. They devoted roughly two and a half to almost three hours teaching mathematics on the day of observations. For example, Mrs Smith's (pseudonym) lessons also accommodated slow learners. She used various examples and methods until she was satisfied that her learners provided correct answers to what she was teaching them. Only when satisfied with the oral work would she allow the learners to proceed with the classroom activity for that day.

From the observations, it was clear that Mrs Smith prioritised teaching strategies. She explained a concept as many times as needed to ensure that learners who battled were able to repeat what she did. She later explained that usually, during this time, the learners who grasped concepts easily were prepared additional worksheets for them to revise previously taught concepts. However, in the lessons I observed, the worksheets were not provided.

Ms Smith strongly felt that it was her duty to ensure that an all her learners understood the concepts at the end of the day. She further stated:

> As teachers, we end up using more time because we have to make sure our learners understand the concepts as they all have different cognitive abilities, even though they are in one class (see Appendix C4).

When asked about her teaching, she explained that she had learners who easily grasped all the concepts and some who took much more time than the rest of the class and she accommodated them all to make sure that no learner was left behind, irrespective of their cognitive ability. She made the following statement:

> I always try to make sure that my learners understand what I am teaching them. I never move on to the next concept or allow my learners to complete the activities in their books, unless I feel certain that they do understand the concept they are being taught. I do this because I want them to do well during when assessed. Therefore, my focus is not only the stipulated time, but rather my learners' abilities in class and how they cope with what is being taught to them (see Appendix C4).

According to MacIntyre (1981), meaningful learning is not only situated in a practice but also in standards of excellence and obedience to rules that are essential to achieve the internal goods of a practice. In his view, for a practice to be learnt and properly internalised, the whole teaching and learning enterprise, which has to lead to success is important. Such success is not possible unless there is familiarity with the behaviour that is required by the practice. Therefore, given the prescriptive and non-negotiable nature of standards of excellence, it was crucial that the teachers make the learners be aware that "to enter in a practice is to accept the authority of those standards and the inadequacy of one's own performance as judged by them [seniors of the practice]" (MacIntyre, 1981, p. 189) rather than engage in considerable repetitions of teaching the same content. At no point did the two teachers explain to the learners the importance of the set outcomes to what they were expected to be able to do and how to do so. For example, Grade 3 learners were to be taught mathematics to develop a competence with number operations, relationships and calculations (DBE, 2011).

Therefore, teachers should have devoted attention to number patterns to consolidate the learners' number ability. It was important that the learners' roles in the lessons should have been structured by involving them in number operations, relationships and calculations more visibly than it was the case. They seemed to have spent most of the time watching the teacher explain and thereafter called upon to provide correct answers. They should have been made to get more involved in activities and interactions that facilitate the internalisation of these mathematical functions as what had to be learnt (MacIntyre, 1997). Therefore, the significance of the time adjustments made by the teachers was interesting to probe in order to understand its impact on the pacing of lessons suggested by the CAPS and, subsequently the learning outcomes for Grade 3 mathematics. Data related to the point is presented and made sense of below.

5.2.2. The teachers' use of time in mathematics lessons and the pacing suggested by CAPS

In response to the question: 'How do teachers use the prescribed time to encourage learners to facilitate the understanding of important concepts and procedures of the subject content taught?, the data collected from to be interviews indicated that all four teachers often exceeded the recommended time when teaching, especially when teaching what proved difficult concepts for the learners. As a result, time for other subjects (English, Afrikaans and Life Skills) was compromised. A very good example was given by Mrs Dlamini:

> If the policy says this week I must teach a new topic when the learners had not in grasped the concept taught the previous week, for example, we were doing fractions, and I personally felt that my children were not understanding them. I now had two concepts which my learners were likely not to understand. So, that meant by the Thursday of the new week, I was revising fractions and, on top of that, I had to make sure they understood time, which was the concepts for the current week. I could not just go to the next concept without finishing the one that they don't know (see Appendix C1).

This is an example of how teachers struggled with curriculum coverage. As a result, they were falling behind but as argued by, for example, Ensor et al. (2009) and Jansen (2013), they could not view these problems of curriculum coverage and pacing as mainly related to subject expertise. Mrs Smith (pseudonym) seemed to appreciate the authority of the guidelines given. She argued:

> The activities which I have to complete in a week determine at what pace I teach. If there is too much work to be covered, unfortunately, I have to work at a faster pace. As a result of this, some learners are left behind. They do not understand the work, but I have to move on, or else I will not complete my concepts and the activities which have to be written for that week. This is what determines standards in the system. If learners are slow, that is the sign of their readiness for the grade (see Appendix C1).

The view was also supported in the following response:

> I go according to the CAPS and school timetable. They set the pace at which we work in class on the concepts. If ta concept is difficult and learners take longer to grasp it, that means I will have to create additional time out of the stipulated

> accommodate them. If they understand and find a concept easier to grasp, that means I am able to work faster and they meet the standards set for them (see Appendix C1).

Mrs Dlamini (pseudonym) also indicated "I stick to what is prepared for that week." She worked according to what she prepared for the week, regardless of whether the learners are able to grasp the concept or not. She worked at a pace that ensured she covered the curriculum given for that week. She explained that this was mainly because of the how strict the districts are over submissions of the curriculum coverage and supporting evidence (learner's workbooks.) Teachers have to submit work at the stipulated times. She stated.

When the teachers were asked what they prioritise when teaching, there were mixed responses. Some emphasised the need for learners to grasp concepts while others prioritise the coverage of the curriculum. Mrs Ndlovu prioritised her learners' understanding and felt that it is of utmost importance for them to understand what they are being taught. This was made clear from her response:

> I do not adhere to time stipulated on my classroom timetable. I go with what my children need at that time. I teach and re-teach by means of repetition until I feel positive enough that my learners understand the concept [of] fractions that I am teaching to them. Because of their different cognitive abilities, I find myself teaching a concept until the slower learners understand me. I will have to go with their ability (see Appendix C2).

Reeves (2006) has argued that classroom pedagogy contributes significantly to poor learner performance, especially in the FP. Since pedagogy is informed by the teacher who oversees all decisions at classroom level, decisions on teaching strategies and the pacing of lessons are the responsibility of the teachers. They have to use their discretion in deciding on how best to structure all lessons in class. Also, according to Bernstein (2000), the pedagogic device assists the teacher in determining the strategies that best support learners in an attempt to close the gap between what learners know and can do and what they do not know and cannot do. Therefore, it was important for the teachers in this study to assume authority and decide on the best strategies and pacing for their learners. They were teaching a collection type of educational knowledge and were thus responsible for determining competence. To ensure that learners performed to their full potential it was their role to explore different ways of recontextualising the content they taught. In the South African context, the content or knowledge to be distributed or shared was officially

determined but as the implementers of the CAPS as official policy, they had the authority to decide on how best to recontextualise this knowledge for it to be learnt effectively.

However, because of the strict curriculum coverage control within their education system, they faced a dilemma when having to exercise this professional responsibility. They also preferred strategies that they were personally comfortable with and viewed as yielding the best results. For example, Mrs Ndlovu explained that she preferred that learners write their answers on the blackboard because the strategy kept them alert and thus, involved in the lessons. She also indicated that it excited the learners. They became more involved in the lessons and enjoyed being in front of the class.

Mrs Smith said that she too involved learners for demonstration purposes. For example, when doing addition and subtraction equations, she would ask the learners to be added or subtracted from a number given. She explained how this method is productive as follows:

> I can just say most of the time I like to use children. To demonstrate, I use children, for instance, let's say if we are busy with addition, I use the children as the objects to add, because what is very difficult to those children is to solve problems. But they have to solve problems. And then you have to take some of the children and work with them and demonstrate (see Appendix C4).

Mrs Smith enjoys her strategy of carpet teaching. This is where all learners sit on the carpet in front of the blackboard and the teacher explains and teaches them while they are seated there without any books in front of them. Once she is confident that the learners understand the concept, she sends them back to their desks where they do the written activity.

Even though she would like to use the strategy often, the time stipulated in CAPS did not always allow for carpet teaching. For example, during one observation (7th May), the learners were preparing for assessments and were unable to participate in carpet teaching as there was too much content to be covered. The learners also had to complete certain activities carried over from the previous week.

Mrs Smith explained that she enjoyed using real-life situations and the learners' experience. For example, when covering the concept of money, she liked to have the learners sent to the store by a parent to purchase items with a certain amount of money and they would have to calculate the correct amount of change that they should return with. She would often use monopoly money to expose the learners to simulations of real-life situations. However, this was not always possible

because of the time the strategy consumed. In particular, when official assessments were due Mrs Smith had to rush her teaching. At this time, she mainly used one strategy to teach and quickly gave the learners the class activity. The priority was to cover the prescribed content and get them ready for the tests.

The teachers also provided examples of what they consider the most effective methods to teach, for example, group teaching and the use of concrete objects. Group teaching is when learners are grouped according to their cognitive abilities as it is easier to focus on groups of learners who take more time to grasp concepts and give them more focused attention. However, Mrs Ndluvu and Mrs Smith preferred to mix the various groups and encouraged the stronger learners to assist the other learners through peer teaching. This was seen as an inclusive method of teaching as no learners were singled out based on their learning abilities. The following table gives an overview of the participants' priorities when devising their teaching strategies.

Table 5.2: ***Priorities in teaching strategies***

Teacher's pseudonym	Length of interview transcribed	Years of experience in teaching Grade 3	Priority
Mrs Dlamini	35:45	5	Time stipulated and curriculum coverage
Mrs Ndlovu	39:16	5	Learners' grasp of concepts
Mrs Kasu	38:35	9	Time stipulated and curriculum coverage
Mrs Smith	36:15	7	Learners' grasp of concepts

MacIntyre (1981) explains that, in virtuous practices, there are rules which govern a particular practice. For teaching specifically, the time stipulated is one of the rules that should be adhered to as part of the criteria to judge competence. The CAPS stipulated the time to teach various concepts. But the teachers were not always able to use their preferred strategies with these times. They had to make do within the limited times and make their lessons as fruitful as possible in these conditions. Therefore, it is perhaps reasonable to argue that, when this is the case, Lave's (1996) view that learning inside the schooling system can cause restrictions and becomes less meaningful. The set standards of excellence had to be met within a restricted time and the teachers seemed not to understand how this could be possible. Because they understood the allocated time as chronological rather than social time, when they tried to accommodate the learners' cognitive inclinations this was also done chronologically rather than as part of the interactions in the classrooms. They viewed learners as subjects to be taught rather than interacted with. They also did not understand that their lessons could not be otherwise but reflect inter-subjective engagements. Their teaching strategies had to work systematically and achieve excellence through submission to standards and obedience to rules with social time. Therefore, it was important to recognise that such time could not only involve technical skills, but inter-subjective relations that facilitated the internalisation (MacIntyre, 1997) of the concepts taught and had to be learnt.

The central constructs of such inter-subjectivity, according to Jaworski (2015), concern the meanings that human beings make in relation to each other and the tasks in which they are involved. Therefore, it is reasonable to argue that the learners' involvement in lessons should have been informed by principles that deliberately organised their experiences (Jaworski, 2015) in the lessons. These experiences had to form the building blocks or scaffolding for developing an understanding of subject content. The experiences had to be structured in accordance with the time allocated for teaching particular concepts in the school timetable. The timetable could not be overlooked as it was part of the aspects that had to influence how social time had to be used.

According to Adler and Sfard (2017), most of the poor learner performance in South Africa is a result of the relay of knowledge from the teacher to the learner. Furthermore, as pointed out by Ensor et al. (2009), because the teaching and learning that have been conducted over the past few years in the schools have not changed much in terms of daily strategies, the teachers preferred to stick to familiar practices when teaching and their efforts were limited as regards

impact. This affected the learners' performance directly and perhaps explains the general poor performance of the majority of learners.

5.3. Pedagogy

This section attempts to answer the question, 'how do the teaching activities and strategies reflect the Grade 3 mathematics teachers' understanding of the importance of the time allocated for teaching problem solving in mathematics Grade 3 influence mathematics teaching and learning at Grade 3 level? The CAPS policy document provides examples of how concepts should be taught in class and which strategies teachers could possibly use. However, during observations, it was clear that the teachers did not consult the document and rather used strategies they are most comfortable with to ensure that the learners understand the concepts, and most importantly and at times, so that the curriculum would be covered to meet deadlines. They also seemed to be frustrated by the time allocated for the curriculum and indicated that time limited their choice of teaching methods. Their argument was that the stipulated time made them struggle to cover the prescribed subject content. In general, all four teachers used a direct approach when teaching.

5.3.1. Teachers' activities and strategies in mathematics lessons

The teacher would explain a concept using various examples and then ask the learners questions to establish if they knew the correct answer or not. Teachers would also ask learners to explain in their own words how they understood the concept and thereafter asked them to write their answers on the board.

Ensor et al.'s (2009) study demonstrates that in the FP, learners need much more attention, and various strategies need to be used to accommodate all of them and their various cognitive abilities. In trying to find out whether or not teachers took these aspects into account when deciding how to teach, they were asked about what informed their teaching strategies and Mrs Smith responded as follows:

> To be quite honest… I would like to try different teaching strategies. Like this week we're supposed to be revising for the task, but because learners still do not understand fractions, which I taught last week, and they're in the task; so now I have to reteach fractions. I have tried to vary my teaching and I guess, this is the

> time to find out which strategy works for them. If I were to focus on how to use different methods every time I teach, I would cover all the prescribed subject content. I would fall behind with my curriculum coverage. Therefore, I often teach using the easiest strategy where I explain the work and give examples. I am unable to make it exciting and use different strategies most of the time (see Appendix C4).

Mrs Smith pointed out that she used methods that she enjoyed. She felt unrestricted by curriculum coverage and indicated the following:

> I also love using concrete objects, and if you do it practically, like using counters to count, learners become involved and seem to understand better. However, this takes up a lot of my time, and my curriculum coverage often falls behind and I have to constantly catch up. Sometimes in the first week of the new term, I am busy with work I did not complete in the previous term (see Appendix C4).

Friday was her 'catch up' day for all activities missed during that week. She explained as follows:

> To catch up the work for the week that I did not cover – because time is not enough for all the activities our learners are expected to do – I'm able to do it on Friday as it's always a catch-up day. So, if I didn't finish it through the week, I know Friday I'll do the catch-up (see Appendix C4).

In the case of Mrs Kasu, she was adamant that, no matter what, she made sure she covered work in accordance with the curriculum coverage document, supplied by the district. She would find herself teaching at a fast pace and leaving some learners behind to ensure that her curriculum was covered in the timeframe stipulated in policy. She prioritised curriculum coverage over the learners' ability to grasp the concepts taught.

5.3.2. Curriculum coverage

In South African schools, curriculum coverage is indicated by the suggested number of activities that have to be done per concept per week. Each district provides schools with a curriculum coverage document that should be followed and a report handed in every five weeks. This document helps monitor whether teachers are covering the expected number of activities each week. When asked how this monitoring affected the performance of learners, it became clear that the teachers had difficulty in keeping up with the amount of work to be done each week and were constantly finding themselves using time intended for other subjects to catch up on mathematics

activities. They felt overloaded with the expected written work. This compromised teaching time as they would at times prioritise completing the required written activities. They were also unable to use all teaching methods, especially those that engage the learners adequately and made sure they used available resources to develop their understanding of the subject content taught. Mrs Ndlovu would, at times, not complete work from one term and then would use the first week of the next term to catch up on the activities missed. As Magome and Nkosi (2014) also observed, this is a typical example of how quantity is prioritised over quality within schools.

In contrast, Mrs Dlamini and Mrs Kasu who prioritised covering the stipulated curriculum activities. Mrs Kasu highlighted the implications of the pressure of having to complete what she considered a large number of activities for mathematics. She mentioned that some of her learners were left behind as she was unable to spend sufficient time repeating lessons to help them understand concepts. She explained:

I stick to what is prepared for that week. I do not have enough time to ensure that all learners are grasping the concept. I try to cover the work, the provided curriculum coverage, because, at the end of the day, I have to give the report. What I have to report on the activities I am expected to have written; they must appear in my learners' books.

Mrs Ndlovu explained that her teaching depended on the difficulty of concepts for the week. If learners understood the concepts easily, she easily completed all written activities. However, if dealing with complex mathematical concepts, there would not be enough time to cover all the written work and the teaching time would be extended. She then used the following week to try to catch up the work.

When teaching a concept, if my learners are grasping that concept, I will need less time to teach because I don't have to explain it many times. If the concept is difficult, I need to explain it and teach until I am sure they understand it. This will take up so much time that I will often have to do the written activities the following week as the week was used for explanations only.

Mrs Ndlovu also explained that she was not able to use all the skills she learnt at the university. She was extremely unhappy about the lack of adequate time to teach as she was taught:

> At varsity, we learn about all the teaching methods to use for foundation phase learners, but when you start teaching, you realise that it is not always practical to do

> what you were taught. Especially in Grade 3, the workload is too heavy for these young children and more time is needed to explain the work to them. They take long to grasp concepts. You need to have time for repetition and reinforcement. The methods which are most effective take time and with the little time given for the amount of work they are expected to do, I end up frustrated and just ensuring that my report indicate that my work is up to date (see Appendix C2).

A major concern was that learners were expected to deal with two or three different concepts in a week and these could be too many when considered against of the available time. For example, Mrs Smith indicated that this confused the learners as each concept had to be understood in different ways using rules and specific steps that needed to be followed to solve a problem. This was her reaction to the expected work in the curriculum:

> Personally, I think the curriculum is a problem, because I think there's just too many concepts that needs to be taught in the same week. I think we are focusing more on covering what is supposed to be done instead of teaching. So, there's too much. Curriculum is too much honestly, it's too much. For me, the learners have a short concentration span. I feel like we are overloading them (see Appendix C4).

Bernstein (2000) has argued that the discourse which takes place between the teacher and the learner is very important for the acquisition of knowledge. In his view, the collective methods and strategies through which knowledge is converted into pedagogic communication can restrict or enhance the intrinsic grammar of a pedagogic discourse. Since, at an abstract level, the discourse specialises time, text, and space and these aspects affect cognitive, social, and cultural elements of education, the teachers in the study needed to pay special attention to how they recontextualised the mathematics they were teaching within the allocated time. Therefore, although their recontextualisation had to consider the time, they could no underplay the importance of established ways of communicating the subject content.

Their instructional practices had to be based on rules that would generate the knowledge and skills that the learners needed to acquire. However, they seemed to believe that such a system of regulating social interactions within lessons could be arbitrarily decided upon. They were unaware that it determined the moral order on which the instructional discourse of mathematics had to be based (Singh, 2002). Within mathematics as a knowledge structure, teachers are considered figures of authority and the CAPS assumed they would know what to do to shape relations in pedagogic practices within the allocated times to meet the set outcomes of lessons.

As Lave (1996) explained, learning is about being initiated into a community of practice and not simply recognition of subject content or being familiar with it. But, the teachers' strategies emphasised the latter. There was a gap between how they thought about their teaching and what the CAPS and their district expected. Thus, failure to accept the authority of the time allocation as standard implied undermining rules that constituted virtuous (MacIntyre, 1981, p. 18) practice for the CAPS formulators.

In MacIntyre's (1981) view, for a practice to be learnt and properly internalised, not only standards of excellence and obedience to rules (discipline) are important, but the whole teaching and learning enterprise, which has to lead to the achievement of 'goods' that are unachievable without familiarity with the standards of excellence and behaviour that is required. For anyone to be part of a practice, they must do and act as told or show a desire to do so.

Virtues require obedience to rules with the intention of achieving set outcomes. MacIntyre (1997) argues that, in terms of quality, they enable individuals to define their social role, assist them to achieve goals and become successful. Therefore, in the context of this study, for the teachers to have been able to demonstrate an understanding of the allocated time as social time, they ought to have abided and obeyed the allocation and seen it as crucial to the standards of excellence that were to be made accessible to FP Grade3 mathematics learners

5.4. Conclusion

The Grade 3 teachers in this study except for one were unfamiliar with the CAPS policy and the stipulated time for mathematics each week. However, even though the other three were aware, at times they were not adhering to the CAPS and school-level classroom timetable provided. They exercised discretion and overlooked the allocated time and suggested pacing of lessons when learners faced challenges with the subject content taught. There seemed to be little appreciation, on the teachers' part, that the set standards of excellence or outcomes had to me met within the suggested pacing. Although educationally sound to prioritise the learners' needs rather than what the experts who formulated CAPS thought would be appropriate for the mathematics competences that were to be developed at Grade 3, the guidelines could not be overlooked without instead of departmental deadlines; however, at times, they are conflicted when making these decisions. Chapter 6, amongst other issues, summarises these findings and reflects on their significance in relation to the theories and methodology that were employed in the study.

Chapter 6: Summary of findings, conclusion and recommendations of the study

6.1. Introduction

This chapter summarises the findings of the study and highlights the significance of the conceptual framework and methodology used to these findings. This is followed by a discussion of the limitations, in particular, how the limited scope and time of the study influenced its design and what it could capture and clarify. Finally, recommendations for further studies are made based on the findings.

6.2. Summary of the findings in the study

In general, the Grade 3 teachers who participated in the study blamed the officially determined and restrictive time and workload for the manner in which they taught. First, they were aware of the time stipulated in CAPS for teaching different concepts of FP mathematics and tried to observe it to the best of their ability. However, the findings in the study indicate that they did not understand how they could try out different strategies within this time. In their view, it restricted ways in which it could be translated into different teaching practices. The views they expressed about this time in the interviews, often did not reflect an understanding of the time as social time. They tended to emphasise the importance of awareness and sensitivity to the learners' needs and seemed not to appreciate that the factors were part of the multiple criteria that needed to be considered, within the stipulated time, if their teaching was to meet set outcomes.

The teachers followed the timetables provided by their school management and displayed in their classroom, which stipulated exactly what to teach each day and the specific periods in which the teaching had to take place. However, the mismatch between the school CAPS' based planning and what was done at classroom level, reflected a lack of understand of what was to happen socially to initiate learners into a community of practice (Lave, 1996). The pace in the lessons seemed to be linked to learners' needs and cognitive abilities rather than the time stipulated in CAPS. The teachers tried their utmost best to make sure that all learners were at the same level in terms of the expected outcomes despite their various cognitive abilities. This meant extending the stipulated time and teaching a concept, often through methods that emphasised recalling content rather understanding and confusing the learners' ability to reproduce the content with understanding. The teachers misconceived familiarity with content with grasping concepts and confidently moved to other concepts once they witnessed the reproduction of the content on the board and written tasks. Therefore, it is perhaps reasonable to conclude that extending the time to teach implied using a performance pedagogic model rather than the competence one, could be seen as a distortion of what Bernstein (200) counsels should happen when teaching a collection type curriculum such as mathematics. In short, learners' cognitive development should have involved immersion into the mathematical functions they had to learn. Only through deliberate involvement would the established rules of how to work with numbers in different ways be learnt by doing and then concepts would developed from experiencing the rules in practice. This was a crucial aspect to consider in establishing whether or not the teachers' understood the CAPS for Grade 3 mathematics. The evidence presented here indicates that they failed to do so.

The expectations in the CAPS document also included a considerable number of classroom activities that had to be completed each week by the learners. The amount of work involved prevented the teachers from using concrete objects in teaching, group teaching and constant repetition that they deemed more effective for FP learning. As a result, the prescribed curriculum coverage provided to the schools by the district was concerning and mainly responsible for the predominant use of methods such as carpet teaching and whole class /group teaching rather than a task bound teaching strategies. It is reasonable to assume that it is such pedagogy that affects the general quality of teaching in FP mathematics and subsequently, responsible for learners' performance that has been evident in international and other tests.

Overall the conceptual framework that is used in the study assisted me identify conceptually what needed to be investigated when studying social time. First, it helped me identify what was

conceptually important for collecting data that would help me respond to the posed research questions satisfactorily. For example, Lave's 1996 study helped me in understanding that learning is about being initiated into a community of practice and not simply the recognition of subject content or being familiar with it. Second, with McIntyre's (1981 & 1997) works, I was able to reflect on the teaching strategies of mathematics teachers and examine whether or not they created a classroom environment that facilitated effective teaching and learning of mathematics, that is, virtuous practices. Third, Bernstein's (2000) concept of the pedagogic device helped me to interpret the practices witnessed in Grade 3 mathematics based on the rules of recontextualisation he argues cannot be overlooked in pedagogic communication. Without these theories as conceptual and heuristic tools, it would not have been possible to provide insights based on conceptual rigour. I hope, with their help, I have managed to meet the demands of this task.

As regards research methodology using the phenomenological approach, my study focused on the teachers' experiences of the CAPS, district, their school and other stipulations related to the use of time in their lessons. What the teachers did in lessons and how they explained it helped me set aside any biased opinions and preconceived assumptions I might have had about their lessons. My interpretations had to be put alongside theirs as firs order constructs to arrive at the findings presented here as third order constructs. Data collection and meaning-making on my part (second order constructs) could not be imposed on how the teachers understood their actions and explained them in relation to the time stipulations in, for example, the CAPS. The observations of the lessons and one-on-one interviews thus facilitated the collection and interpretation of data in an unbiased manner. Without bringing myself closer to the participants by creating a safe space where they could act naturally during lessons and talk openly about them it could not have been possible to look at my interpretations in relation to theirs. Therefore, I hope I managed to present a true reflection of how they understood the time the CAPS allocated to the different mathematics concept taught in Grade 3. Ensuring confidentiality in the study allowed the teachers to act and speak freely and as honestly as possible. It made it possible to collect useful data to draw on when answering the research questions.

6.3. Limitations of the Study

This study can be viewed as a baseline study (Maree, 2010) because its scope and the time available for fieldwork as a part-time student, limited it to one school. Albeit, the insights it provides, lays the foundation for a larger study with greater scale and more depth.

6.4. Recommendations

Teachers should be exposed to professional development on how to analyse the various guidelines in the CAPS curriculum for them to interpret and implement it effectively. More school level workshops and cluster meetings should also be held where teachers could voice their concerns and difficulties. This could require more competent subject specialists than is currently the case. In addition, teachers could advise each other on the ways to teach and manage their classrooms effectively, both inside and outside of the classroom in the workshops.

Participant action research could be conducted by policy-makers and analysts to facilitate evidence based policy studies. The involvement is likely to be beneficial for future policy revision that is context responsive and meaningful.

The number of activities learners are expected to complete each week could be decreased as this will allow more time for teaching and reinforcing what is taught. This will also allow teachers to use the teaching strategies that tend to be time-consuming but ineffective. The number of concepts taught each week could be limited to one or two instead of having various mathematical concepts to teach each week. Similar concepts could be grouped together in an effort to link teaching across mathematical content.

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Appendices

Appendix A: Observation tool

Name of Educator…… Date…….

Criteria	Observation	Notes
Is the educator teaching the stipulated content for the specific week?		
Are learners interested and fully engaged in the mathematics lesson being taught to them?		
Which teaching strategies are most prominent in the lesson? Do they seem effective in keeping the learners interested?		
Was the time stipulated by the CAPS document being adhered too?		
Are the learners able to complete their classwork in the stipulated time for mathematics?		
In relation to the presented lesson what is the overall view and observation about the classroom pedagogy?		

Appendix B: Observation Schedule

Observation schedule

Teacher	Date	Time
Mrs Dlamini	6 May 2019	8:00
Mrs Ndlovu	6 May 2019	12:15
Mrs Kasu	7 May 2019	8:15
Mrs Smith	7 May 2019	12:15

Appendix B1

Name of Educator: **Mrs Dlamini** Date: **06-05-2019**

Criteria	Observation	Notes
Is the educator teaching the stipulated content for the specific week?	Educator is teaching the concept written in the district curriculum coverage document.	
Are learners interested and fully engaged in the mathematics lesson being taught to them?	Most learners are engaged however there are a few learners who are constantly chatty and not paying attention.	
Which teaching strategies are most prominent in the lesson? Do they seem effective in keeping the learners interested?	The teachers is mainly teaching and asking questions, learners are seated at their desks. They are often distracted and constantly fiddling with books and pencils.	Carpet teaching could be more effective in helping control the chatty learners.
Was the time stipulated by the CAPS document being adhered too?	No, The teachers used additional time for teaching as learners had difficulty grasping the concepts.	
Are the learners able to complete their classwork in the stipulated time for mathematics?	No, there are learners who do not understand what was being taught and the educator has to constantly go to them and try and see where they are having difficulty.	Group teaching could have been beneficial if time allowed the educator to assist the slow learners with the additional time.
In relation to the presented lesson what is the overall view and observation about the classroom pedagogy?	Teaching methods were limited, the teaching lacked creativity. Most teaching was done through the educator explaining the work. Lack of learner participation and involvement.	

Appendix B2

Name of Educator: **Mrs Ndlovu** Date: **06-05-2019**

Criteria	Observation	Notes
Is the educator teaching the stipulated content for the specific week?	The educator is revising a concept the learners did not grasp.	This is good for the educator to ensure her learners understand a concept completely before starting with a new concept. However, she will fall behind with her work.
Are learners interested and fully engaged in the mathematics lesson being taught to them?	The learners are well behaved and listening attentively to the educator. They are participating in the lesson.	The educator displays good control over her learners.
Which teaching strategies are most prominent in the lesson? Do they seem effective in keeping the learners interested?	The educator is using carpet teaching. Because the learners are closely seated the educator has better control over them. The learners are kept interested. Learners are asked to write answers on the board.	Carpet teaching seems very effective to better implement discipline. Writing answers on the board keeps learners engaged. Prioritized learners needs.
Was the time stipulated by the CAPS document being adhered too?	Time is not adhered to. The educator spent the entire time of my observation time teaching mathematics.	Educator was consistently asking questions. This consumed a lot of time.
Are the learners able to complete their classwork in the stipulated time for mathematics?	Fast learners wrote activities in their books. Slow learners stayed with the educator who carried on teaching them. All the time was basically contact time as the educator was constantly teaching.	Learners could become tired and not take in information due to the long length of time spent teaching. Slow learners activities were adjusted, given 5 sums instead of 10.
In relation to the presented lesson what is the overall view and observation about the classroom pedagogy?	Teaching methods were limited. Teacher used two methods only.	

Appendix B3

Name of Educator: **Mrs Kasu** Date: **07-05-2019**

Criteria	Observation	Notes
Is the educator teaching the stipulated content for the specific week?	Yes. Educator is teaching the concept written in the district curriculum coverage document.	
Are learners interested and fully engaged in the mathematics lesson being taught to them?	Most of the learners were engaged. Only two learners were not paying much attention to the educator because they were on punishment for incomplete homework and standing at their tables instead of being seated.	The punishment for incomplete homework is disadvantaging the learners.
Which teaching strategies are most prominent in the lesson? Do they seem effective in keeping the learners interested?	The educator had the learners seated and she was in front of her class teaching to the learners. No carpet teaching displayed. She would often use counting cubes.	
Was the time stipulated by the CAPS document being adhered too?	Yes. The educator seems very aware of the time, she is always checking her watch. Learners were able to complete the activity in their books while I was there.	The educator does not seem to reinforce knowledge after teaching. Learners are sent to their desks to complete the workbook activity due to time constraints.
Are the learners able to complete their classwork in the stipulated time for mathematics?	Yes. All learners completed the workbook activity for the lesson taught.	What is the standard of work completed? Not all learners seemed to have grasped the concept. This is worrying.
In relation to the presented lesson what is the overall view and observation about the classroom pedagogy?	Classroom pedagogy seems limited. Teacher rushes through content and there is a lack of variety and creativity.	

Appendix B4

Name of Educator: **Mrs Smith** Date: **07-05-2019**

Criteria	Observation	Notes
Is the educator teaching the stipulated content for the specific week?	No, the educator exceeds stipulated time for a concept. She is consistently teaching and asking questions.	
Are learners interested and fully engaged in the mathematics lesson being taught to them?	Learners are very interested in the lesson being taught. They are well disciplined and are active participants.	The educator has a big presence in the class. She understands her learners well and knows exactly what her learners respond too.
Which teaching strategies are most prominent in the lesson? Do they seem effective in keeping the learners interested?	When teaching learners are used as objects for doing addition and subtraction in class. The educator also has some counting cubes to display how to do the two concepts.	These methods keep learners very engaged and excited to participate in class.
Was the time stipulated by the CAPS document being adhered too?	No. The methods used were time consuming and the teacher could not use the time stipulated she exceeded it.	
Are the learners able to complete their classwork in the stipulated time for mathematics?	Learners do start with the class activity however, the school day ends before they are able to complete the activity.	Time seems to be limiting the educator's ability to use these good methods, they are unable to complete activities when using certain methods.
In relation to the presented lesson what is the overall view and observation about the classroom pedagogy?	The educator displayed some good teaching methods. Her lesson was enjoyable however she could have done more if time allowed.	

Appendix C: Interview questionnaire

Interview questions.

1. How long have you been teaching Grade 3 mathematics?
2. How much time is allocated for mathematics Grade 3 in the CAPS document?
3. How do you work? Do you adhere to the weekly time given by the CAPS document to teach Grade 3 mathematics?
4. What about the timetable? Do you adhere to your weekly timetable for your Grade 3 class and teach according to the timetable drafted by the school? How is it related to the CAPS document?
5. Are you able to cover all given content each week for your mathematics lessons?
6. What do you prioritise when teaching? Please explain and give reason.
7. How do you view the time prescribed in the CAPS document? Do you think about it when you plan your lessons or present them in class?
8. How do keep your learners interested in the concept you are teaching within the prescribed time?
9. Which teaching strategies do you find most effective when teaching mathematics? Explain how they are linked or not to the prescribed time in the CAPS document.
10. How does the use of time affect learner performance for mathematics in your classroom?
11. As an educator what do you think needs to change in order to improve the results for Grade 3 mathematics?

Appendix C1: Interview with Mrs Dlamini

Interview questions.

1. **How long have you been teaching Grade 3 mathematics?**
   I have been teaching Grade 3 for seven years now.
2. **How much time is allocated for mathematics Grade 3 in the CAPS document?**
   In the CAPS document, I don't know. But usually a day, me I spend like 30 actually just teaching, then writing activities is more. It can be more than hour.
3. **How do you work? Do you adhere to the weekly time given by the CAPS document to teach Grade 3 mathematics?**
   Yes. I have to stick to what I prepared for the week.
4. **What about the timetable? Do you adhere to your weekly timetable for your Grade 3 class and teach according to the timetable drafted by the school? How is it related to the CAPS document?**
   Not always but I certainly do most of the time. It depends on, on that day. For example, maybe sometimes Home Language there's a lot to cover on that day that and I really need to really push the learners. So sometimes Home Language will take up the time meant for Afrikaans or Life Skills, and Life Skills I'll have just a little bit of time in which I need to complete them both. If the policy says this week I must teach a new topic when the learners had not in grasped the concept taught the previous week, for example, we were doing fractions, and I personally felt that my children were not understanding them. I now had two concepts which my learners were likely not to understand. So, that meant by the Thursday of the new week, I was revising fractions and, on top of that, I had to make sure they understood time, which was the concepts for the current week. I could not just go to the next concept without finishing the one that they don't know
5. **Are you able to cover all given content each week for your mathematics lessons?**
   For the week I'm able to do it because Friday it's always a catch-up day. So if I, I didn't finish it through the week, I know Friday I'll do the catch-up.
6. **What do you prioritise when teaching? Please explain and give reason.**
   I try my best to make sure learners grasp the concept, but I always make sure my curriculum is covered. So sometimes the learners get left behind. This is because there's a lot that we supposed to do. It is not helping the end of the day because all you want to do is finish the work you are supposed to.
7. **How do you view the time prescribed in the CAPS document? Do you think about it when you plan your lessons or present them in class?**
   No, I don't.

8. **How do keep your learners interested in the concept you are teaching within the prescribed time?**

   I don't teach them sitting at their tables. Whenever it's teaching time they have to sit here on the carpet. So, when they are sitting here, I'm able to do the work with them. They go back to their tables that's when I know at least now they've heard what I wanted them to hear. They will be able to do the work correctly. As an educator you will think they have grasped the concept and that they will all say I understand. However, when you mark the books, it's something else. You become really disappointed.

9. **Which teaching strategies do you find most effective when teaching mathematics? Explain how they are linked or not to the prescribed time in the CAPS document.**

   I think teaching them in groups. If you can teach in small groups, it's better than the whole class teaching. The use of objects is also very effective.

10. **How does the use of time affect learner performance for mathematics in your classroom?**

    I think time affects us greatly, the time that is given is too short, especially with mathematics. When it comes to mathematics you have to, for example do counting every day before you can begin with the day's content. So, time is too little if you stick to time you will never complete work or your learners will be left behind.

11. **As an educator what do you think needs to change in order to improve the results for Grade 3 mathematics?**

    The workload is too much. They have been given lot of work. They have to complete written activities daily.

Comments: *None*

Appendix C2: Interview with Mrs Ndlovu

Interview questions.

1. **How long have you been teaching Grade 3 mathematics?**

I have been teaching this Grade for 5 years.

2. **How much time is allocated for mathematics Grade 3 in the CAPS document?**

   I think it's five or six hours if I'm not mistaken.

3. **How do you work? Do you adhere to the weekly time given by the CAPS document to teach Grade 3 mathematics?**

   No, not necessarily. Sometimes the time over lapses depending on the concept that you are teaching. When marking books you see that they did not understand a concept. Now you need to go back and reteach that concept, that concept. Up until that time it elapses, and you end up using additional time. But I try to adhere to time which is not always possible. I will teach a concept until I am positive that my learners have grasped that concept. If not, I will continue teaching using different methods to explain to ensure that they fully understood what they were taught before moving along or doing the activity in their workbooks

4. **What about the timetable? Do you adhere to your weekly timetable for your Grade 3 class and teach according to the timetable drafted by the school? How is it related to the CAPS document?**

   In our school the timetable is drafted directly from the CAPS document. In terms of me adhering to the timetable and what subjects comes next, I don't know. I only stick to teaching mathematics first thing every morning as it is printed on the timetable. The length of my lessons are not according to the timetable. The other subjects depend on what I needed to emphasize or not, but I don't adhere to it. I believe for me personally I can't move to another concept when I am not yet confident half of my class is grasping the concept. I can't. I do not adhere to time stipulated on my classroom timetable. I go with what my children need at that time. I teach and re-teach by means of repetition until I feel positive enough that my learners understand the concept [of] fractions that I am teaching to them. Because of their different cognitive abilities, I find myself teaching a concept until the slower learners understand me. I will have to go with their ability. Since I have said that there are children who work at different paces, there are those children who are very, very slow, and you have to try to also accommodate them. Try to help them, to give them extra time. Therefore, you find yourself unable to move on to the next subject, even if it is stipulated in the timetable. Sometimes in mathematics there's a lot to do on that day, and I need to really push. So, mathematics will take the time for Afrikaans or Life Skills…, I'll have just a little bit of time. Then, the following

day, I will spend more on Life Skills, you see, so that I can catch up on what I have missed. Therefore, I don't really follow the school timetable

5. **Are you able to cover all given content each week for your mathematics lessons?**
   Not, not really. That's why I said sometimes yes, it will depend on that week what you do. If that week they seem to be understanding each and everything concept then you are able to complete the work, but sometimes other weeks it's not possible. This is because we carry over whatever that you didn't finish to the next week.
6. **What do you prioritise when teaching? Please explain and give reason.**
   I think the focus is more the learners understanding the concept. I think that's one of my main concerns. That I fall behind because I'm not happy with some concepts and the way learners did not understand. To me I prefer for them to know the work rather than finishing the entire curriculum for that particular day. I'd rather be behind but I know whatever I've taught previously, I don't have to return to that concept. Only when revising for tests. CAPS does not make allowance for learner's cognitive abilities. Children work at different pace's such as slow and very slow so I try to accommodate them by giving them extra time.
7. **How do you view the time prescribed in the CAPS document? Do you think about it when you plan your lessons or present them in class?**
   I do not consider time when planning my lessons focus is on my learners and how I will assist them to grasp concepts.
8. **How do keep your learners interested in the concept you are teaching within the prescribed time?**
   It's easy to prepare the day before and get the necessary resources. Everything that I would need for that particular day. So I always prepare beforehand. So if I need to get pictures from the internet I would get it then. Everything of mine it has to be prepared for me the previous day. Because I don't like to come not prepared. I place them on the carpet so they are not distracted by books or pencils at their desks. I use objects. I also love using concrete objects, and if you do it practically, like using counters to count, learners become involved and seem to understand better.
9. **Which teaching strategies do you find most effective when teaching mathematics? Explain how they are linked or not to the prescribed time in the CAPS document.**

I'm trying to do like group teaching, I think for me the best teaching technique it's when you group them according to their ability, which always has differentiation of learners which is always a challenge, and it's a very big challenge. This is because sometimes they end up being very disruptive and then you have to stop and discipline them. But I try to do it where they mostly they would do concrete objects. I use most of the concrete objects and then if we can do it practically, we do it practically. That's what I would like to do using these methods take up a lot of time. Therefore, I am always going above the time given.

10. **How does the use of time affect learner performance for mathematics in your classroom?**

    I think time management is the biggest issue, it's a challenge in terms of that. When teaching you forget about time when you are focused on your learners grasping a particular concept. So you teach and teach and then time elapses. They lose focus because you kept on doing the same thing over and over again. So the class becomes disruptive sometimes. Time is a big factor and their heavy workload. To be quite honest… I would like to try different teaching strategies. Like this week we're supposed to be revising for the task, but because learners still do not understand fractions, which I taught last week, and they're in the task; so now I have to reteach fractions. I have tried to vary my teaching and I guess, this is the time to find out which strategy works for them. If I were to focus on how to use different methods every time I teach, I would cover all the prescribed subject content. I would fall behind with my curriculum coverage. Therefore, I often teach using the easiest strategy where I explain the work and give examples. I am unable to make it exciting and use different strategies most of the time.

11. **As an educator what do you think needs to change in order to improve the results for Grade 3 mathematics?**

    I think the curriculum, for me I think the curriculum is really a problem. I think there's just too many concepts that needs to be taught at the same time, that's my problem. I think we're focussing more on covering what you supposed to do instead of teaching. There's too much, the curriculum is too much honestly. The learner's concentration span, is too short for the heavy workload. The workload needs to be reduced. That is the main thing that is affecting these learner's performance. I think we will rather drill and emphasize on reading and that the children are able to count independently you know all those things. So that when they get to Grade 4, then they don't say the children cannot read, the children cannot count.

Comments: *There are so many strategies that we were taught at university, but we are unable to make use of them because of the stipulated time. We also received training for assisting weak learners and how to get them to standard, but because of time being so limited I am unable to use these skills. At varsity, we learn about all the teaching methods to use for foundation phase learners, but when you start teaching, you realise that it is not always practical to do what you were taught. Especially in Grade 3, the workload is too heavy for these young children and more time is needed to explain the work to them. They take long to grasp concepts. You need to have time for repetition and reinforcement. The methods which are most effective take time and with the little time given for the amount of work they are expected to do, I end up frustrated and just ensuring that my report indicate that my work is up to date.*

Appendix C3: Interview with Mrs Kasu

Interview questions.

1. **How long have you been teaching Grade 3 mathematics?**
   It's for 2 years now after my resignation, and if I count the previous years before I resigned, it was 5 years.

2. **How much time is allocated for mathematics Grade 3 in the CAPS document?**
   I am not sure.
3. **How do you work? Do you adhere to the weekly time given by the CAPS document to teach Grade 3 mathematics?**
   Of course, I do adhere, but sometimes it happens that you exceed. This is because it depends to the pace of the children. Maybe you exceed a few minutes. It's like when they have to do their mental maths. What is allocated in our school for them to finish their mental maths is 10 minutes, but you can see that those children who cannot manage to do their mental maths out of 30 in 10 minutes and then you have to give them extra time.
4. **What about the timetable? Do you adhere to your weekly timetable for your Grade 3 class and teach according to the timetable drafted by the school? How is it related to the CAPS document?**
   Yes, I do try. But sometimes because since I have said that there's different pace of children. Try to help them to give them extra time. Because sometimes we find out that when the others are almost finished, but sometimes the others are just starting, you know. Yes, they are not the same pace in the same pace, and since because of the load of the work in Grade 3 you can't have that time of remedial activities. You try to squeeze it to try to explain it further.
5. **Are you able to cover all given content each week for your mathematics lessons?**
   Yes.
6. **What do you prioritise when teaching? Please explain and give reason.**
   I stick to curriculum coverage. I cannot just work on my own, my own you know. I stick to what is prepared for that week. This is *because at the end of the day I have to give the report, and what I have to do to report it must appear in my learners' books I have to be honestly. If we are going to have some assessment then I can just try to revise somethings that will be in the assessment.*
7. **How do you view the time prescribed in the CAPS document? Do you think about it when you plan your lessons or present them in class?**
   I think the time that is incurred is not enough. There is too much to be done, but the time is too little. When you look at the work that is supposed to be done time is limited, because even if you have to introduce a new lesson, you have to start with the known to the unknown. During that introduction time is elapsing and now you can see that there are

those children who cannot grasp the concept or focus, and you have to try to make the in such a way that it accommodate all learners you are teaching.

8. **How do keep your learners interested in the concept you are teaching within the prescribed time?**

   I try a lot to involve them, to make them active, to use the things that they know. Concrete things, or, as I have said that even when I'm doing the story sums, it must be a story, they must just imagine something that is happening before they solve the problem. I use a lot of concrete things because they are still young.

9. **Which teaching strategies do you find most effective when teaching mathematics? Explain how they are linked or not to the prescribed time in the CAPS document.**

   Most of the time I like to do group teaching, mix the children so that there are those who grasp quickly can also help those who are slow. There are times I feel like I can have extra time to take those who are very slow together and just do things practically with them, but because of the time, sometimes you know you don't have enough time.

10. **How does the use of time affect learner performance for mathematics in your classroom?**

    It affects them because most of the time I can find out that my children fail, some of them fail to finish the task in the set time. They fail. You need to give them extra time. Sometimes we say okay, you are not going for your lunch break if you have not finished. Of which you know now it deprives a child that time of playing outside with their peers. The time is too little, because these learners, most of them they are too slow. You find out there are a few of those just you know that cannot complete activities.

11. **As an educator what do you think needs to change in order to improve the results for Grade 3 mathematics?**

    Mainly time is a problem, it is not enough to complete the work and use the correct strategies. I suppose I need some in-service training like workshops within the schools you know. If, let's say we are five in Grade 3 teachers maybe I'm much better than the others in the breaking- up method for mathematics I can train the other teachers to better teach that concept and they can do the same with some of the other concepts.

Comments: *None*

Appendix C4: Interview with Mrs Smith

Interview questions.

1. **How long have you been teaching Grade 3 mathematics?**
   It has been nine years now.
2. **How much time is allocated for mathematics Grade 3 in the CAPS document?**
   I think maybe 4 hours, in the CAPS document, I don't know how much time is stipulated.

3. **How do you work? Do you adhere to the weekly time given by the CAPS document to teach Grade 3 mathematics?**

   Yes I try my best, however it is not always possible. The activities which I have to complete in a week determine at what pace I teach. If there is too much work to be covered, unfortunately, I have to work at a faster pace. As a result of this, some learners are left behind. They do not understand the work, but I have to move on, or else I will not complete my concepts and the activities which have to be written for that week. This is what determines standards in the system. If learners are slow, that is the sign of their readiness for the grade. To catch up the work for the week that I did not cover – because time is not enough for all the activities our learners are expected to do – I'm able to do it on Friday as it's always a catch-up day. So, if I didn't finish it through the week, I know Friday I'll do the catch-up.

4. **What about the timetable? Do you adhere to your weekly timetable for your Grade 3 class and teach according to the timetable drafted by the school? How is it related to the CAPS document?**

   No my darling you can't, because as you could see I have 40 children and they are all different. So the others will be very slow, you can write mathematics the whole 2 hours. So maybe in CAPS they only giving you one hour, and you still have to teach, do activities and even help with those that are struggling. So with that hour there's no way that you can cover everything. So I don't go with time table I go with what my children's needs at that time. I go with their level. If they are slower, I will have to go with their level.

5. **Are you able to cover all given content each week for your mathematics lessons?**

   Not always, there are times when the learners are working slowly, and they are not grasping in the concept then I go with their pace. I don't go with what the curriculum wants. But I'll cover those concepts that are in the curriculum, but at the learners own pace, their work pace.

6. **What do you prioritise when teaching? Please explain and give reason.**

   The grasping of the concept, that's what I want. Not curriculum coverage.

7. **How do you view the time prescribed in the CAPS document? Do you think about it when you plan your lessons or present them in class?**

   To be quite honest I don't. Let's just say maybe I decided to start with counting. They going to say counting for 10 minutes in the policy, but you can say 10 minutes and then like when you counting in 3's you see that there is no way, they are not counting the way that

I want them to count, they are still struggling. So it's going to even take more than 10 minutes you see. Then I will end up using extra time on counting and I have not even started with the concept of the day.

8. **How do keep your learners interested in the concept you are teaching within the prescribed time?**

   I'm using the models and the real-life situations, I use monopoly money and do examples of learners going to the shop to buy items for their parents and they must calculate the change. Things that they have experienced. They like working with models, not just writing on the board. I also want them to go and write in the board, so that makes them excited to just stand and be in front of the class. To teaching the class, that also makes them excited.

9. **Which teaching strategies do you find most effective when teaching mathematics? Explain how they are linked or not to the prescribed time in the CAPS document.**

   I can just say most of the time I like to use children. To demonstrate, I use children, for instance, let's say if we are busy with addition, I use the children as the objects to add, because what is very difficult to those children is to solve problems. But they have to solve problems. And then you have to take some of the children and work with them and demonstrate.

10. **How does the use of time affect learner performance for mathematics in your classroom?**

    To be quite honest it affects the learners negatively. Like this week we're supposed to be revising for the task, but because I'm not getting in there, as I've said with the fractions, and they're in the task, fractions and money. So now I have to redo those concepts instead of moving in forward. So that affects me even with my curriculum coverage, with everything. I fall behind with my work. All subjects work falls behind instead of us progressing with activities.

11. **As an educator what do you think needs to change in order to improve the results for Grade 3 mathematics?**

    Overcrowding. Let me not only say time because I take my own time to do my work. The thing is when I'm taking time for mathematics the other subjects fall behind. Like Life Skills and Afrikaans I normally do them Thursday and Friday. So Monday, Tuesday, Wednesday I'm pushing Mathematics and Home Language which is English. So do you see those two are lacking, yes. So, time too. But mostly it's overcrowding. I also ppersonally, I think the curriculum is a problem, because

I think there's just too many concepts that needs to be taught in the same week. I think we are focusing more on covering what is supposed to be done instead of teaching. So, there's too much. Curriculum is too much honestly, it's too much. For me, the learners have a short concentration span. I feel like we are overloading them.

Comments: *None*