An analysis of what are Grade 3 learners 'approaches to working in the Systemic Assessment in Mathematics.

A thesis submitted in fulfilment of the requirements for the degree of Magister Educationist in Mathematics Education in the Faculty of Education, University of the Western Cape

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ABSTRACT

Over the past 5 years, the performance of Grade 3 learners in the Systemic Assessment for their grade has been seen as contradictory to the pass rate of Grade 3 learners. Using a mixed-method research approach, this study investigated how classroom teaching and learning influences learner performance in the Systemic Assessment. The problem underlying this perceived discrepancy is situated in the assessment in Mathematics education, as well as in the teaching and learning in Foundation Phase Mathematics. Cognitive constructivist learning theory has been used to clarify current and emerging assumptions about the process of teaching and learning. This approach aimed to provide a framework for educators to clarify their assumptions and design instructions that are more than an efficient assimilation of prescribed content. The cognitive constructivist learning theory gave insight into the teaching and learning of elementary Mathematics which guided the data analysis. Constructivism is based on the idea that learners construct knowledge from their prior knowledge and experience. The Systemic Assessment results were used to reflect on the teaching strategies and tactics employed by teachers in the classroom to foster understanding of the mathematical concepts and generate the achievement outcomes necessary for Grade 3. The findings of this study revealed an examination driven approach to teaching where conceptual understanding of mathematical concepts is deemed less important. Deep conceptual understanding in mathematics requires teaching that goes beyond how to get to the answer. Instead, we need to support learners' ability to access concepts from a number of different perspectives. In addition to the latter, the study found that the pressure placed on teachers to get learners to perform well in the Systemic Assessment, greatly influences the pedagogical fluency. The study's recommendation is that there should be less emphasis on the results of the Systemic Assessment and a greater focus on the natural ability of the learners as an outcome of quality teaching and learning.

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DECLARATION

I, Carol Felix declare that: *An analysis of Grade 3 learners 'approaches to working in the Systemic Assessment in Mathematics*is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name: Carol Felix **Date:** November 2023

Signed.....

DEDICATION

I dedicate this thesis to my late parents Samuel and Minnie Booysen, who encouraged me through difficult circumstances that I am able to do all things through Christ who strengthens me. Dad, your words still ring in my ears “mik hoog”. To my husband Brian and my two adult children Severiano and Mignon Felix for believing in me and for your motivation. I am grateful for your patience, support, and everything you have done to contribute to my success. I hope I can make you proud.

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ABBREVIATIONS

AFL	Assessment for Learning
ANA	Annual National Assessment
AOL	Asset Assessment of Learning
CAPS	Curriculum Assessment Policy Statement
CASS	Continuous Assessment
CK	Content Knowledge
Covid 19	Corona Virus 2019
DBE	Department of Basic Education
DoE	Department of Education
FP	Foundation Phase
LOLT	Language of learning and teaching
MMR	Mixed Method Research
MSED	Metro South Education District
NAEP	National Assessment of Educational Progress
OBE	Outcomes Based Education
PIRLS	Progress in International reading Literacy Study
PISA	Programme for International Student Assessment
SA	Systemic Assessment
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SBA	School- Based Assessment
TIMMS	Trends in International Mathematics and Science Study
WCED	Western Cape Education Department

KEYWORDS

Assessment

Systemic Assessment

Teaching and Learning

Mathematical Concepts

Mathematical Content

CHAPTER ONE: BACKGROUND AND OVERVIEW OF THE STUDY

1.1 Introduction

My experience as a Foundation Phase teacher led me to investigate the reason why the results of the Grade 3 learners' Systemic Assessment (SA) for Mathematics were not consistent with the school-based assessment results. I questioned why assessment in education developed from a single focus on measurement of real achievement of learners' understanding of mathematical concepts to the growing interest in providing information for policy makers and to support curriculum development. All three forms of assessments (namely, profile assessment, standardised assessment and criterion-referenced assessment) are based on the same set of assumptions of essential knowledge attainment.

In the South-African education context, various measurements of achievement models are used to make judgements about learners' knowledge. These measurements are also used to assist in the transformation of the education system. The Annual National Assessments (ANA) were a set of standardised national assessments introduced by the South African Department of Basic Education in 2011. The Department of Education (DoE) reviewed and reflected on the key elements of the Annual National Assessment (ANA) in 2014 and identified the need for a new perspective on the Systemic Assessment. The aim of the Systemic Assessment model was to evaluate aspects and components of the Education Ecosystem to provide South-African schools, districts, provinces, the DoE and all relevant stakeholders with an evaluation model to obtain quantitative and qualitative data in order to improve system intervention.

1.2 Background and motivation

The Systemic Assessment model replaced the Annual National Assessment (ANA) in 2019. Initially, the Department of Basic Education ran a pilot project in October 2018 with a sample of 10 schools. The Systemic Assessment was aimed at providing the education system with achievement results based on social, economic, and transformational goals. It does this by measuring learner performance in the context in which the learner experiences learning and teaching.

According to the Curriculum and Assessment Policy Statement (CAPS), assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners in a valid and reliable way, using various forms of assessments. The CAPS document is an

interactive process between the learners and their teachers. The CAPS document informs the teachers about the content they are supposed to be teaching in the specific grade. The Systemic Assessment results in Mathematics give an indication in terms of how effectively the teachers are teaching and how well their learners are learning in the classroom. This form of assessment involves generating and collecting evidence of achievement, evaluating this evidence and recording the findings.

The information gleaned in this manner is used to understand and, thereby, assist the learners' development in order to improve the process of learning and teaching. According to the CAPS document, the purpose of assessment is to improve learning and teaching to determine the learners' developmental stage and skill level. Furthermore, the CAPS document facilitates, guides and assists teachers with good-quality teaching practices and participation in the development and learning of learners within a prescribe curriculum. This chapter focused on the methodology that was used in this study. The mixed approach as a method for data collection and analysis was explained. Thereby, CAPS provides insight into the teaching and learning of assessment practices. According to (Brookfield, 1995, p.2), a critically reflective teacher must impart the foundational information and practical tools that help learners to reach their actual potential, working from a position of informed commitment throughout the process, learning Mathematics should involve exploring, validating, representing, solving, constructing, discussing, using, investigating, describing, developing and predicting. Brodie and Pournara (2005) assert that the purpose of learning is to be able to develop deep conceptual understanding of whatever is taught to apply it to authentic and real-life situations. Mathematical knowledge acquisition is intricately intertwined with the way the subject is assessed (Luneta, 2013). Stassen et al. (2001) define assessment as "the systematic collection and analysis of information to improve student learning." (p. 5).

The Systemic Assessment takes place before Grade 3 learners have an opportunity to complete the mathematics curriculum for the year. The School Development Unit (SDU) has been involved in administering the Systemic Assessment in the Western Cape Province since the inception of testing in 2002. This Unit is currently the service provider responsible for implementing the Grade 3 and Grade 6 assessments. A Language and Mathematics test has been administered in grades 3, 6 and 9 in both public as well as independent schools which receive a state subsidy. In 2017, over 100 000 Grade 3s and 85 000 Grade 6s were assessed in over 1 100 schools throughout the province. The SDU has also been responsible for marking the +/-370 000 language and Mathematics scripts that emanated from the Systemic Assessment. According to Debbie Schäfer, Minister of Education (21

January 2019), the Systemic Assessment (SA) in Language and Mathematics is an important resource for the Western Cape Education Department as it determines the levels of our learners' Language and Mathematics abilities. The assessment helps the department to identify specific areas that need improvement and assist schools in improving their outcomes. They are also useful tools for schools and educators as they provide specific information on various learning areas. The Systemic Assessment provides an objective picture of learner performance in Language and Mathematics because it is externally administered and marked.

1.3 Problem statement

Mathematics will remain a critical academic discipline for school learners as it introduces children to a means by which they can make sense of the world around them. Mathematics provides a way to foreground concepts, think in abstraction and develop reasoning strategies. Foundation Phase educators use mathematical techniques, tools, physical objects like cubes, diagrams, and rubrics to support the development of learners' understanding of Mathematics. These tools can serve as a foundation for learning and understanding more complex concepts in Mathematics. Playing games is also an effective way to acquire an understanding of mathematical principles (Kamii, 1982). Mathematical tools foster learning at many levels namely, the learning of facts, procedures, and concepts. A mathematical learning tool can scaffold the learner by performing computations that support learners in solving problems.

If young children are not able to develop appropriate knowledge, skills and understanding of Mathematics in the early grades, the achievement gap will be deep-rooted. The foundational knowledge and skills for mathematical learning in later years are laid in this phase – beginning in Grade R and continuing into Grades 1-3.

The richness of all the work covered in these four grades cannot be fully represented here; hence, teachers will need to apply the learning from these examples across the curriculum. (Mathematics Teaching and Learning Framework for South Africa p. 23) Learners are "forming conclusions about their mathematical abilities, interest and motivation that will influence how they approach Mathematics in later years" (Protheroe, 2007 p. 52). Effective Mathematics instruction begins with effective teaching (Grouws, 2004).

Instruction at the middle grades should build on students' emerging capabilities for increasingly

abstract reasoning, including thinking hypothetically, comprehending cause and effect, and reasoning in both concrete and abstract terms (Protheroe, 2007).

Concepts are built one upon another in a logical, step-by-step progression. Mathematics assessment should be both formal and informal, informal assessments take place by observing practical and written activities that the learner does independently, or in pairs or in a group. Formal assessment provides the teachers with a systemic way of assessing and evaluating the learners' progress. When a child is being forced to learn addition and multiplication before understanding the relationships between numerals and quantities, they may end up memorizing Mathematic facts. On the one hand, understanding will let you describe a concept in your own words, and even teach it to others to help them understand the subject. On the other hand, memorizing helps us recall important information at a specific given time. If you have an important test or task to perform, you're likely going to use your memory for it. However, when you are exposed to activities according to their ability and developmental level, you can move naturally from one level to the next. Based on my experience as a foundation phase teacher it is evident that there exists a considerable disparity between the mathematical abilities of learners and the Mathematics systemic assessment results of the Grade 3 learners, in terms of mathematical skills, abilities and understanding.

The Department of Basic Education (DBE) introduced the Annual National Assessment (ANA) in 2011; it covers the concepts and skills in Numeracy and Literacy taught to learners in Grades one to six. In 2012, Grade 9 learners were included in and exposed to the ANA. The Annual National Assessment was a landmark assessment tool that annually measured progress in learner achievement in Literacy and Numeracy.

The ANA was a developing intervention programme in the South African General Education and Training system. Drawing from the best international practice, a model was crafted that was most appropriate for the South African context. There was an agreement that the ANA programme would be a cornerstone of the Basic Education system that will continue to serve as a diagnostic and systemic evaluation tool.

Like all assessment programmes internationally, acceptance of the outcomes of an assessment or evaluation by the participants in the assessment programme, are fundamental to ensuring that the assessment serves its purpose. According to the Department of Education (2001a): the main purpose of the Systemic Assessment is to benchmark performance and track the progress made towards the achievement of the transformational goals of the education system in respect to access, redress equity

and quality. The Assessment Policy requires that Systemic Assessment be conducted in three grades of the education system, namely grades 3, 6 and 9, which also mark the end of three distinct schooling phases.

In South Africa, it is evident from large-scale assessments that children are performing far below the expected grade levels in the first years of primary school (Spaull & Kotze 2015).

When an assessment method is aligned with the teaching programme, the method will measure what learners know about Mathematics to ensure that they attain the level of knowledge necessary to become productive citizens throughout their lifetimes. For example, administering timed assessments of basic addition and subtraction facts would be part of a programme only if this method is supported by collecting evidence on how well students can provide an explanation of their efficient thinking for determining answers in a variety of ways. If Systemic Assessments are used only to assess the learner's memorisation of facts without understanding, the assessments, as a measure of learning, are not in alignment with the programme goals that aim at the development of number-sense and laying the foundation for developing knowledge of the real number system.

The Systemic Assessment results of Grade 3 learners can be an effective educational tool for many educators to improve their teaching practice. It will assist educators to focus on their teaching method and approach to Mathematics. However, it would seem that the systemic results of the grade three learners' Mathematics assessments are not an actual reflection of the learners understanding and ability of the subject.

According to the Systemic Assessment of 2001, done by the National Department of Education, Grade 3 learners scored 30% in Numeracy. The second Systemic Assessment in 2007 (Department of Education 2008) indicated a 5% improvement, with a result of 35%, but this figure was still below the benchmark. This assessment provides the Department of Education, as well as the school and teachers, with necessary information to guide their ongoing intervention aimed at laying a solid foundation for learning in the Foundation Phase by 2011.

The learner achievement levels revealed by national assessments such as ANA, regional assessments such as Southern and Eastern Consortium for Monitoring Education Quality (SACMEQ) and international assessments such as Trends in Mathematics and Science Study (TIMSS) are indicative, at least in part, of the current ineffective teaching and learning practices. An analysis of the

SACMEQ and TIMSS assessment items reveals that more emphasis is placed on children being able to "think mathematically" than on children being able to calculate.

The national average scores achieved by Grade 3 learners in the South African education system in Numeracy were 30%. The results indicate that learners experience assessment difficulty in Numeracy across all the provinces. The pass rate for Grade 3 Mathematics increased by 1.5 percentages, from 56,6% in 2018 to 58.1% in 2019, which brought the total improvement since 2011 to 10.9 percentage points. However, even with this improvement there are still gaps in the mathematical knowledge of the majority of Grade 3 learners. In judging assessment instruments for meeting the main criteria listed in the Evaluation Standards, four points need to be considered.

- The assessment instrument should provide information that will contribute to decisions for the improvement of instruction.
- The assessment instrument should be aligned with the instructional goals, the goals for the overall programme, and a holistic conceptualization of mathematical knowledge.
- The assessment instrument should provide information on what a learner should know.
- The results from one assessment instrument should be such that when combined with results from other forms of assessment, a global description is obtained of what Mathematics a person or group knows.

The assessment initiatives pointed to the fact that South African learners at all levels of education were underperforming especially in Mathematics, science, and languages (Spaull, 2012). According to Niss (1993) the fundamental purpose of assessment in Mathematics education is to assist with decision-making and take subsequent action. Thus, the objective of this study was to analyse Grade 3 learner's responses in the Systemic Mathematics Assessment. The research objectives for this study are listed below.

1.4 Research objectives:

- To investigate the performance of the grade 3 learners in the Systemic Assessment with the reflection on the teaching and learning of Mathematics.
- To determine the ways in which learners work in the Systemic Assessment in Mathematics.
- To investigate whether the response of the learners in Mathematics Assessment reflects their learning.

- To determine whether how learners work during the Systemic Mathematics Assessment reflects how teachers are teaching Mathematics.

1.5 Research question

What are Grade 3 learners approaches to working in the Systemic Assessment in Mathematics?

Sub research questions

- In which way do the responses of learners in the Systemic Mathematics Assessment reflect their learning?
- Do learners' ways of working in the Systemic Mathematics Assessment reflect the way teachers teach Mathematics in the classroom?

What follows is a concise review of relevant literature that contributed insight into the objectives set out in the study.

1.6 Summary

This chapter presented the introduction, the background and the motivation for the study. In addition, it articulated the problem statement, outlined the research questions and objectives and detailed the significance of the study

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of previous research on Systemic Assessment in Mathematics in Grade 3. It introduces the framework of how learners work in Mathematics in the Systemic Assessment. The research focuses on the following:

- Content and process standards, in conjunction with the curriculum and the outcome.
- The role of assessment in informing instruction and promoting learners learning.
- Using Mathematics systemic test results to make instructional decisions.
- Evaluate the learner's achievement in the Mathematic and modify teaching practices**.**

In South African schools, assessment entails gathering, examining, and interpreting data to support judgements about the development of learners. The official curriculum for grades R through 12 is found in the National Curriculum Statement. Systemic Assessment in Mathematic measures students' comprehension of the subject, coordinates outcomes with learning objectives and encourages engagement. The purpose of classroom assessment is to effectively determine student achievement to direct instruction. Assessment methods evaluate knowledge, abilities, attitudes, and values across all subjects throughout the Foundation Phase. Continuous assessment for learning, and formal assessment of learning are both included in Mathematics assessment. Techniques used in this process include written documentation, oral conversations, practical demonstrations, and observation. Differentiated assessment assignments are essential, considering both the capacities of the learners and the particular concepts and skills being evaluated.

2.2 Assessments in education

Assessment is an essential part of the teaching process in education. It is the ongoing process of gathering evidence of what each learner actually knows, understands and can do. Assessments include formal, informal, formative and summative assessments. Educational assessment is the systematic process of documenting and using data on the knowledge, skills, aptitude and beliefs to refine programmes and improve learning and teaching. The purpose of assessment is to improve how efficiently the curriculum teaches and guide the learners through the concepts and skills they are

required to know and demonstrate.

2.3 The National Assessment of Educational Progress NAEP

The National Assessment of Educational Progress (NAEP) is a continuous and representative assessment of U.S. students' knowledge and skills in subjects like Mathematics, reading, science, and writing. It is administered by the National Centre for Education Statistics (NCES) and provides objective information about student performance and educational progress. Key features of NAEP include a nationally representative sample, long-term trend assessments, and main subject areas. Participation is voluntary, but a sufficient number of schools and students is required to ensure validity and reliability. Results are reported in terms of average scores and achievement levels, allowing for analysis of achievement gaps among different student populations. NAEP uses various assessment tools, including multiple-choice questions, short constructed-response tasks, and extended constructed-response tasks, to measure students' critical thinking, problem-solving, and analytical skills. The information gathered through NAEP helps policymakers and educators make informed decisions about education policies and practices, identifying areas in need of improvement and measuring the effectiveness of educational initiatives.

The NAEP frameworks are devised through a development process that ensures they meet current educational requirements. Assessment must be flexible and mirror changes in educational objectives, curricula and standards of student's achievement. The National Assessment Governing Board develops the NAEP framework for assessments in each subject. The National Centre for Education Statistics (NCES0 initiated this effort to link the National Assessment of Educational Progress (NAEP) scales to the Trends in International Mathematics and Science Study (TIMSS) scale so that states could compare the performance and academic achievement of American students with students in other countries.

2.4 Trends in International Mathematics and Science Study

The International Association for the Evaluation of Educational Achievement (IEA) conducts the Trends in International Mathematics and Science Study (TIMSS), an international assessment, to gauge students' achievement in Mathematics and science at various grade levels. In South Africa, standardised examinations to assess students' knowledge and proficiency in certain disciplines are usually administered at the fourth and eighth grade level, while learners in other countries participate in similar or equivalent examination assessments at the secondary school level. The findings are

applied to international student performance comparisons and the identification of worldwide trends in science and math education. TIMMS data is also useful to researchers, educators and policymakers, who consult it to make well-informed choices concerning educational practices and policies. A wider range of skills and knowledge categories are the subject of other international tests, such as the Programme for International Student Assessment (PISA).

TIMSS assessment is curriculum-based, reflecting the skills and knowledge taught at schools. Mathematical skills are globally recognised as key competences for the development of an individual, society and economy. The Strategic planning document of the Department of Basic Education, Republic of South Africa (DBE) (2011:77) states:

> The problem of poor-quality teaching and poor subject matter knowledge of our teachers, a legacy of apartheid teaching training, is one of the biggest impediments to improved delivery of quality education in the system as a whole as measure by poor leaner's performance not only in international test (TIMSS trends in international Mathematics and Sciences Study) and PIRLS (Progress in International reading Literacy Study), but also in our own Systemic Evaluation. (TIMSS 2019)

2.5 The Programme for International Student Assessment

The Programme for International Student Assessment (PISA) is a globally recognized assessment conducted by the Organisation for Economic Co-operation and Development (OECD) to evaluate the academic performance of 15-year-old students in reading, Mathematics, and science literacy. PISA aims to provide valuable insights into the education systems of participating countries and enable international comparisons of students' abilities and knowledge.

Because 15-year-old pupils are usually reaching the conclusion of their obligatory education, PISA examinations take place in three-year cycles with an emphasis on students in this age group. The examination measures students' critical thinking and problem-solving skills, in addition to their knowledge, by highlighting their capacity to apply what they have learned to practical contexts. Furthermore, PISA incorporates contextual questionnaires that collect data from educators, school administrators, and students in order to provide a more comprehensive knowledge of educational results with respect to a range of criteria, including student demographics, school environment, and teaching methods (OECD, 2021).

Global education policies are shaped in part by PISA results. These findings are used by educators and policymakers to pinpoint areas where their educational systems need to improve and to draw lessons from the effective practices and policies of high-performing nations. PISA assists nations in improving the quality of education and preparing students for active engagement in contemporary society by offering a thorough assessment of education systems and assisting in the decision-making process (OECD, 2021). PISA assesses whether students can apply what they've learned to solve real world problems in a wide variety of situations. PISA test units do not link to any curriculum used at schools but their use in the classroom is highly recommended, as PISA tests help to evaluate the quality of Mathematics and science.

2.6 The Annual National Assessment

The Annual National Assessments (ANA) are standardised national tests in Mathematics and language. These tests were introduced by the South African Department of Basic Education to assess students' proficiency in languages and Mathematics during their academic journey. ANA covers three crucial phases: the foundation phase (grades 1-3), intermediate phase (grades 4-6), and senior phase (grades 7-9). In the senior phase (grades 7–9) and the intermediate phase (grades 4–6), ANA assesses language and Mathematics. In the foundation phase (grades 1–3) ANA is used to assess literacy and numeracy. The National Department of Basic Education provides the question papers and marking memos (exemplars), while schools oversee test administration, marking, and internal moderation. Since education is the foundation of society growth, evaluating the success of educational programmes is essential to guaranteeing the advancement of a country. The Annual National Assessments (ANA) have become a vital instrument in South Africa for assessing students' proficiency in Mathematics and languages at various stages of their education. The ANA is a comprehensive national assessment system that is administered by schools and is governed by standardised question papers and marking notes issued by the National Department of Basic Education. The assessments are standardised, ensuring uniformity and fairness across the nation. This dissertation explores the ANA's implementation, structure, and effects on South Africa's educational system.

The question papers and marking memoranda, known as exemplars, are meticulously designed, and provided by the National Department of Basic Education. Schools are entrusted with the responsibility of conducting the tests, marking student responses, and engaging in internal moderation. This decentralized approach empowers schools to actively participate in the assessment

process, promoting a sense of ownership and accountability within the education system.

1. *Data-Driven Decision Making*: ANA generates valuable data that informs evidence-based decision-making at various levels of the education system. Educators, school administrators, and policymakers utilize this data to identify areas of improvement, design targeted interventions, and allocate resources effectively.
2. *Quality Assurance and Accountability*: By setting standardised benchmarks, ANA establishes a framework for educational quality assurance. Schools and teachers are held accountable for their students' performance, fostering a culture of excellence and continuous improvement.
3. *Tailored Interventions*: ANA results enable educators to identify specific learning gaps among students. This targeted approach allows for customized interventions, ensuring that students receive the necessary support to enhance their academic achievements.

The Annual National Assessments (ANA) played a pivotal role in South Africa's education system, providing valuable insights into student proficiency and educational effectiveness. By utilizing standardised assessments, ANA empowered schools and educators to make informed decisions, implement targeted interventions, and uphold accountability standards. The collaboration between the National Department of Basic Education and individual schools underscored the importance of a decentralized yet standardised approach to education evaluation.

In contrast to summative assessment, the ANA is an essential formative assessment. The assessment was designed to draw on information gathered in the assessment process to identify learning needs and to adjust teaching accordingly. In its 2011 report on the ANAs, the DBE stated that the ANA would impact on four key areas at school and district levels: they would:

- Encourage teachers to assess learners using appropriate standards and methods.
- Promote better targeting of support to schools.
- Foster the celebration of success in schools by providing schools with a clearer picture of how well they perform in comparison to school facing similar socio-economic challenges.
- Encourage greater parental involvement in improving the learning process.

2.7 Systemic Assessment

In the complex landscape of education, evaluating the performance of schools and their systems is crucial for ensuring quality education and equitable outcomes. Systemic Assessment, a

comprehensive approach to assessing various aspects of the education system, plays a vital role in understanding the strengths and weaknesses of the system. In the South African school context, Systemic Assessment is of paramount importance as the country strives to address historical inequalities and create a just educational environment for all its citizens. This essay explores the significance of Systemic Assessment in the South African school context, examining its methodologies, challenges, and impact on education reform. The Systemic Assessment refers to the determination of the extent to which the education system achieves predetermined social, economic and transformation goals, through the measurement of learner performance.

2.8 Importance of Systemic Assessment

Systemic Assessment in the South African school context serves several essential purposes. Firstly, it provides a comprehensive overview of the education system's effectiveness, identifying areas for improvement and highlighting successful practices. Secondly, it helps policymakers and education authorities in making data-driven decisions, ensuring that resources are allocated efficiently to address the specific needs of schools. Thirdly, Systemic Assessment promotes accountability and transparency within the education system, holding schools, teachers, and administrators responsible for their performance. Lastly, it aids in fostering a culture of continuous improvement, encouraging schools to adopt innovative teaching methods and strategies that enhance learning outcomes.

Systemic Assessment is used to deduce learners' understanding of topics in Mathematics and is linked to learners' outcomes in education. Assessment is the core component of teaching and learning. Systemic Assessment is used in many circumstances in education to strengthen the curriculum and the learning experiences of the learners. The Systemic Assessment includes evidence about what the learners have learnt and teacher has taught. The systemic evaluation is used to measure a learner's progress and reform education.

2.9 Methodologies of Systemic Assessment

Systemic Assessment in South African schools employs a range of methodologies to assess various dimensions of the education system. Standardised testing is a common method used to evaluate students' academic proficiency, providing insights into their knowledge and skills. Additionally, classroom observations and teacher assessments offer valuable qualitative data, highlighting the teaching practices and pedagogical approaches used in classrooms. Surveys and interviews with

students, parents, and teachers provide qualitative insights into the learning environment, school culture, and community engagement. By combining quantitative and qualitative data, systemic evaluation offers a holistic understanding of the challenges and successes within the education system. The Systemic Assessment provides a method to study a programme, a practice intervention or an initiative, to understand how well it achieves its goals. The method helps to determine what works effectively and what could be improved in the education system.

2.10 Challenges in Systemic Assessment

Despite its importance, Systemic Assessment in the South African school context faces several challenges. One major obstacle is the vast socioeconomic disparity among schools, leading to significant differences in resources, infrastructure, and parental involvement. These disparities can skew evaluation results, making it difficult to compare schools on an equal footing. Language and cultural diversity also pose challenges, as assessments and evaluations must be culturally sensitive and inclusive to accurately reflect the diverse student population. Additionally, ensuring the consistent implementation of evaluation methodologies across all provinces and regions can be challenging due to varying administrative capacities and resources.

It is a well-established fact that South African children underperform significantly in language and Mathematics. A high percentage of learners is failing to achieve even the minimum expected standards in these core subjects (Department of Basic Education, 2012). International data indicate that even when compared with low-income countries in Africa, South Africa compares poorly in tests of Mathematics. The reasons for this are complex and rooted in factors that go well beyond the classroom and affect children's development and wellbeing from birth. One Systemic Assessment test for the Grade 3 learners alone cannot adequately assess the complex nature of learners' mathematical thinking.

2.11 Impact on Education Reform

Systemic Assessment has a profound impact on education reform in South Africa. By identifying underperforming schools and pinpointing the specific areas needing improvement, policymakers can direct targeted interventions and support mechanisms. This focused approach helps in bridging the educational gaps and promoting equality. Moreover, Systemic Assessment fosters healthy competition among schools, encouraging them to learn from each other's successes and adopt best

practices. Systemic Assessment also empowers parents and communities with valuable information about school performance, enabling them to actively engage in their children's education and demand accountability from educational institutions.

In conclusion, Systemic Assessment in the South African school context is indispensable for fostering a high-quality, equitable, and inclusive education system. By addressing the challenges and leveraging diverse evaluation methodologies, South Africa can continue its journey towards providing excellent education for all its learners. Systemic Assessment not only guides education reform but also empowers stakeholders to create a nurturing learning environment that equips students with the skills and knowledge necessary for a bright future. Through continuous efforts and a commitment to data-driven decision-making, South Africa can build a robust education system that serves as a foundation for national development and social progress. Hence, this evaluation is the process of making judgements based on criteria and evidence of the results of the Systemic Assessment. The impact of the Systemic Assessment at the micro level can generate feedback on Mathematics development which can inform how teachers teach and learners learn. (teaching and learning) It can enhance educational opportunities at a macro level where the curriculum can be adjusted due to consistently low rates in the understanding of mathematical concept.

2.12 The WCED Systemic Assessment with the focus on Mathematics

The Western Cape Education Department seeks to facilitate high-quality learning in Mathematics using the Systemic Assessment results to improve Mathematics content knowledge and pedagogical knowledge. The objectives of the Systemic Assessment are to determine the context in which learning and teaching is taking place, obtain information on learner achievement, identify factors that affect learner achievement, and make conclusions about appropriate education interventions. The WCED implement the mathematics strategy as a teaching and learning improvement plan. The Western Cape Education Department implements a reflective practice plan at school level. Each school must develop a target-driven Mathematics improvement plan with collective staff input. To ensure quality Mathematics education for all, there is a need to expand the assessment process to include the other neglected dimensions of Mathematics. The process enables teachers and students to address these aspects of Mathematics in the teaching and the learning process. Mathematics is the science that deals with the logic of shapes, quantity and arrangements. The Systemic Assessment provides the most objective picture possible of learner performance in Mathematics, giving the province the opportunity to assess whether they have improved in quality of education.

2.13 Mathematics in the Foundation Phase

In Grade R-3, it is important to know that the content area of Number, Operation and Relationships carries the biggest weight in the Mathematics curriculum. Learners need to exit the Foundation Phase with a secure sense of numbers and operational fluency. The aim is for learners to be competent and confident with numbers and calculations. However, the emphasis in the teaching and learning of Mathematics in the Foundation Phase in schools across our country continues to focus on basic calculation. The aim is for learners to be competent and confident with numbers and calculation.

These are the five content focus areas on Mathematics for the Foundation Phase according to the Curriculum Assessment Policy Statement that contributes to the acquisition of the specific skills.

- Number operations and relationships
- Patterns, functions and algebra
- Space and shapes
- Measurement
- Data handling for learners to attain essential mathematical skills, they should develop the following areas:
- Develop the correct use of the language of Mathematics.
- Develop number vocabulary, number concept and calculation and application skills.
- Learn to listen, communicate, think, reason logically and apply the mathematical knowledge gained.
- Learn to investigate, analyse, represent, and interpret in formation.
- Learn to pose and solve problems.

Lin, Lawrence and Goral (2003) state that educators' perceptions are critical as they impact on the way they teach and ultimately on the progress of the learner. There are three critical components to effective Mathematics instructions (Shellard & Moyer, 2002)

- Teaching for conceptual understanding.
- Developing children's procedural literacy.
- Promoting strategic competence through meaningful problem-solving investigation.

Emergent numeracy skills including counting, number knowledge, and estimation and number

pattern predict later Mathematical competency in elementary grades. (Duncan et al., 2008; Geary, 2003; Geary, Hoard & Hanson 1999; Jordan eta l, 2006). These skills will prepare and equip the learner for further studies in Mathematics. According to the Department of Education (2009), learning without understanding contributes to many of the problems experienced by learners in Mathematics classrooms. The National Development plan envisions that by 2030 schools will provide all learners with quality education, especially in Literacy, Mathematics and Science. In aiming to ensure that quality education is provided to all South African learners, the country has introduced three curriculum reviews since 1994.

2.14 Challenges when teaching Mathematics in the Foundation Phase

The process of making sense of students' mathematical thinking, is much more complex than might be anticipated and it often challenges teachers' "ways of thinking about Mathematics and Mathematics teaching and learning," (Watson, 2006). Some teachers suggest that adopting and using new assessment practices is a complex process that needs to be well supported, particularly by colleagues (e.g., Crespo & Rigelman 2015). As noted by Black et al. (2004), in the process of embedding assessments into instructional practice, teachers must first reflect on their current practice and then attempt to implement changes in small steps, much like the "engineering design "approach to assessment development advocated by Swan and Burkhardt (2012).

The knowledge of Mathematics must be constructed by the individual learner which means learners need to build on previous mathematical knowledge. In some instances, learners in the foundation phase are passive; they just receive knowledge. In these instances, learning is not a process of discovering an independent pre-existing world outside the mind of knower [Von Glasersfeld, 1988; Kilpatrick, 1987].

The teachers should know how to use mathematical language effectively in order to transfer knowledge. However, failure to do so worsen the children's mathematical problems. Margolines, Coulange and Bessot (2005:206) argue that a teacher's knowledge is very significant in Mathematics education. The teacher should also possess a sound understanding of the learner's prior knowledge in order to avoid teaching learners' content that they already know or hat is too difficult for them to grasp (Askew et al., 1997:23). According to Askew (1997:21) practicing mathematical lessons in the classroom is the major factor influencing learning outcomes. A teacher's incorrect and limited

knowledge of Mathematics in the Foundation Phase will impact detrimentally on what learners will learn.

2.15 The impact on Performance in Systemic Assessment

The Systemic Assessment has enhanced teaching and learning in the schools and district. The teachers motivated the learners regarding the need to excel in the Systemic Assessment instead of motivating the learners to love the subject of Mathematics itself. The results of the Systemic Assessment in Mathematics answer the question of how learners learn in Mathematic as a grade and a school but not as an individual learner. The assessments have an impact on the performance of the grade and the school but not on the individual learners.

Recognising the strength in the Mathematic result in the Systemic Assessment teachers can build on it and use it effectively. Systemic Assessment results are valuable tools for educational institutions. They assist in evaluating the effectiveness of institutional practices by tracking the functioning of different components in the Mathematics of the assessment system in the Western Cape.

2.16 Assessment for Learning

Assessment in Mathematics should be both informal assessments for learning (AFL), and formal assessments of learning (AOL). Informal assessment involves daily monitoring of learners' progress through observations, discussions, practical demonstration, and everyday learner -teacher classroom interaction. Formal assessment uses memoranda, rubrics, checklists, and rating scales as well as other appropriate assessment tools to observe, assess and record learners' levels of understanding.

Assessment for learning (AFL) of Mathematics in Foundation Phase focuses on learners, as they are more involved in the assessment process. Learners are more aware of their thought process, which can later be used to make changes in thinking (Kling & Bay-Williams, 2014). (Leedy & Ormrod, 2001; Williams, 2011).

There are two major types of assessments that are discussed in most literature, namely, formative and summative assessment (Cornelius 2013). One the one hand, the purpose of the Summative assessment is instructional, evaluative and predictive and aims to provide data for policy makers. On the other hand, formative assessment, which is also known as an alternative form of assessment, has

been described as Authentic assessment, Self-assessment, Dynamic assessment and Performance assessment. Archer, Rossouw, Lomofsky and Oliver (1999) defines formative assessment as any form of assessment in which the learner provides answers to specific questions using their own ideas, words, and conceptions or by displaying creativity in the class.

Formative assessment (AFL) is highly beneficial for both the learner and teacher (Creswell & Plano Clark, 2011). It is important to know that the assessment programme requires not only knowledge and skills, but also the application of said knowledge and the skills. Assessment is an integral component of the Teaching and Learning cycle.

2.17 South Africa Curriculum

Since South Africa's first post-apartheid election in April 1994, the Minister of Education has introduced three national curriculum reform initiatives focused on schools. In 1997, South Africa launched a new curriculum, Curriculum 2005 (C2005). The underlying philosophy of 2005 was Outcome Based Education (OBE) and the Revised National Curriculum Statement (RNCS), both of which have strong outcomes-based underpinnings, and thirdly, the Curriculum and Assessment Policy Statement (CAPS) which is mainly content driven.

According to the Curriculum and Assessment Policy Statement (CAPS) for the Foundation Phase there are three aspects or skills that are singled out because these strategies form the backbone of the learner's numerical development.

- The skills encompass the level to which the learner is able to count concrete objects or pictures correctly, and the learner's ability to write and read the number symbols.
- Determining if learners understand how to do a straightforward grouping and sharing problem.
- Determining if learners can communicate their thinking pattern by explaining verbally and if the learner is reasoning in a grade- appropriate way.

The above are some mathematical skills that Grade 3 learners need to acquire.

CAPS has the potential firstly, to equip the South African learners with the skills required for the 21st century and secondly, to prepare learners adequately for the demands of the 4th Industrial Revolution, which emphasises cyber –physical production systems as espoused by the World Economic Forum.

The MATHEMATICS TEACHING and LEARNING FRAMEWORK FOR SOUTH AFRICA has been developed to assist teachers to pay attention to the manner in which Mathematics is taught and hence learned. The five-part framework adopted for the South African context has been influenced by the conceptualization of Kilpatrick's five strands of mathematical proficiency.

The steps that should be adopted to bring about the transformation of Mathematics teaching in South Africa involve the following: teachers should strive to teach Mathematics for conceptual understanding to enable comprehension of mathematical concepts, operations, and relationships teach so that learners develop procedural fluency. This involves skill in conducting procedures; it is vital that teachers teach to develop learners' strategic competence to solve mathematical problems. Finally, teachers should strive to provide multiple and varied opportunities for learners to develop their reasoning skills and the capacity of logical thinking.

2.18 Feedback and the Systemic Evaluation

Regular feedback must be provided to learners to enhance their learning experience. Feedback can be a powerful tool if it is delivered in an appropriate manner. Feedback addresses both cognitive and motivational factors at the same time. The feedback of the systemic assessments in Mathematics for Grade 3 learners does not provide individual feedback but rather feedback for a class and/or for a grade.

The nature and context of the systemic assessment feedback does not always allow the individual learner to improve much. As feedback is about the process and performance of the class, it does not contain information that can be used by the individual learner for further learning. The feedback or results for Mathematics in the Systemic Assessment of the Grade 3 learners only reveals the connection between the education system and the curriculum.

Lovitt, Stephens & Clarke (1990) claimed that the major uses of assessment related to three parties, namely, the educator, the learners, and the parent. Firstly, the teacher uses learners' responses in assessment to help identify instructional strategies that are more successful and learners learning performance that needs to be encouraged and developed or discouraged and replaced in order to improve instruction to learners. Secondly, assessment informs learners of their identified strengths and weaknesses and informs subsequent teachers of a learners' competencies. Finally, parents are informed of their child's progress so that they can provide more effective support. (Niss, 1993)

Summary

Chapter two gave a review of the literature used in this study that pertains to the research question (namely, what are the ways learners work in the Systemic Assessment in Foundation Phase with Mathematics?) This chapter examined the pertinent literature under the following headings:

How a learner learns and how teachers teach in Grade 3 in Mathematics impacts on the learner's results in the Systemic Assessment.

How a learner understands the application of Mathematics in the Systemic Assessment using the tools they have leant.

CHAPTER THREE: THEORETICAL FRAMEWORK

3.1 Introduction

The chapter outlines the theories that underpin the framework for the research study which is the NATIONAL PROTOCOL FOR ASSESSMENT GRADES R-12 (NPA) The purpose of the protocol is to regulate how evidence of learners' performance is recorded and reported within the framework of the National Curriculum Statement (NCS), which comprises the Curriculum and Assessment Policy Statement (CAPS) for all subjects listed in the National Curriculum.

This chapter addresses the research question: *What are learners' approaches to working in the Systemic Mathematics Assessments?*

Sub research questions

- In which ways do the responses of learners in the Systemic Mathematics Assessment reflect their learning?
- Do learners' ways of working in the Systemic Mathematics Assessment reflect the way teachers teach Mathematics in the classroom?

3.2 Theoretical Framework

The theoretical framework of this study is based on the problem statement, the research question, and the review of literature sources. The study applied both qualitative and quantitative methods to establish the grounds of the theories. The study is designed around a framework to investigate the research questions and to understand the problem. Vygotsky's socio-cultural theory encourages social interactions to cultivate cognitive development. The theory ensures that learners receive assistance as they learn. Vygotsky coined a definition of instructional scaffolding that focused on teachers and others in supporting the learner's development and providing support structures to get to that next stage or level (Raymond, 2000).

The results of the Systemic Assessment in Mathematics are often viewed as an ability and a skill of a learner. Learning and teaching can dictate the understanding of the subject. Numerous studies have been undertaken to investigate if the results of learners 'assessments are an opinion of learners learning and knowledge of the subject. There are key questions and notions that are still not

discussed in the literature on the Mathematics systemic results in Grade 3. This investigation points out some of the issues encountered in the existing research. A more systematic and theoretical analysis is required for additional studies to understand the research questions posed.

According to the Curriculum and Assessment Policy Statement (CAPS), Mathematics is a language that makes use of symbols and notations for describing numerical, geometric, and graphical relationships. It is a human activity that involves observing and representing investigating patterns and qualitative relationships in physical and social phenomena between mathematical objects themselves. It helps to develop mental processes that enhance logical and critical thinking, accuracy and problem solving that will contribute to decision-making (CAPS p. 13.).

Learning experiences can help young children build fundamental understandings of mathematical ideas that will enable them to acquire important mathematical skills. Teaching activities in the mathematical focus areas are vital to develop and nurture strong mathematical skills in Foundation Phase.

3.3 Cognitive Theory

The two main theories of cognitive development are Piagets' theory, which focuses on intelligence and the changes as children grow, and Vygotsky's theory, which centres on social actions an defines intelligence as the capacity to learn from teaching.

According to W. Huitt, Jean Piaget (1896-1980) is considered to be the most influential early proponent of the cognitive approach to understanding learning. According to Berk (1997), Piaget believed that children develop steadily and gradually throughout their different stages and that the experiences in one stage form the foundations for movement to the next.

Cognitive understanding is an interesting learning theory that focuses on thought. Cognition encourages students to "think about their thinking" to help them unlock a concept or subject they struggle with. Learners are encouraged to reflect on their experience to find solutions to their problems. Learner's minds are stimulated through different levels of activities in Mathematics that the teachers design. These opportunities allow learners to think about the Mathematics lesson and explore the questions to figure out the answers.

In 1978, Ausubel formally referred to his theory as assimilation theory to "emphasize a major characteristic; the important interactive role that existing cognitive structures play in the process of new learning"
(Ausubel et al., 1978, p. v).

Ausubel asserts that assimilation is the process whereby new knowledge is incorporated into existing mental structures. Learning is always based on existing knowledge and cognitive structures and can be formal or informal. This is seen as a linking process between prior and new knowledge and skills (Ausubel et al., 1978). Learners enter school with prior knowledge from home and the knowledge is built on through early experiences of the preceding grades I and 2. This implies that children do have a sound basic knowledge and understanding of Mathematics when they enter Grade 3. The learner's prior experience impacts the development of their thinking skills in Mathematics. Learners constantly process new knowledge and encode the information imparted to them.

Figure 3.1

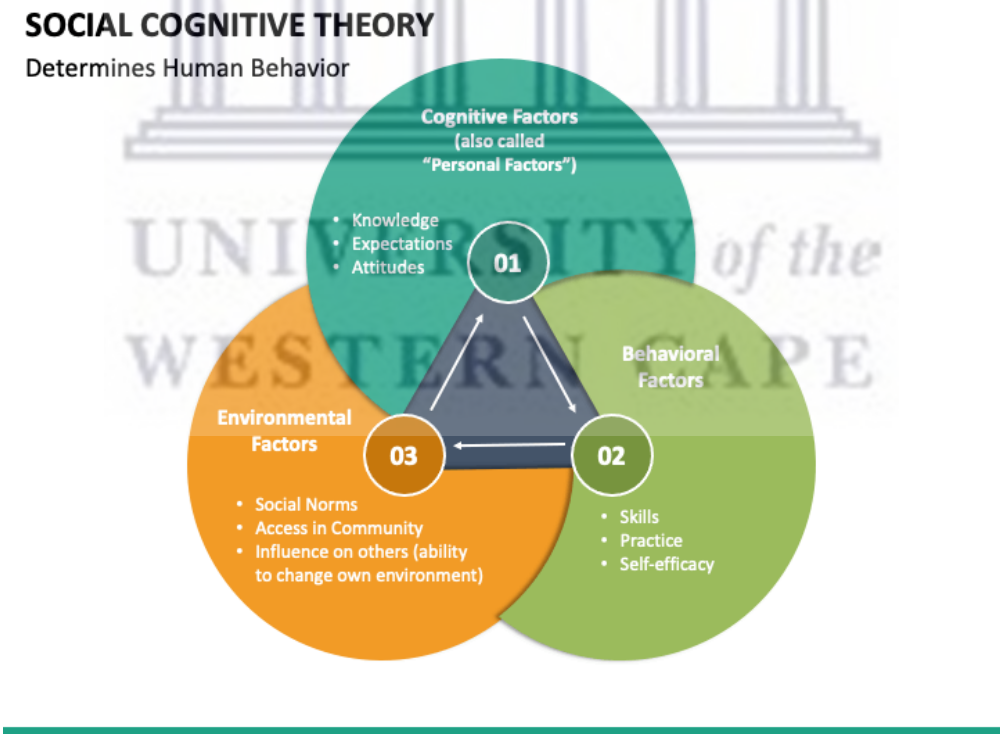

Figure 3.1: ***Determinants of Human Behaviour; Social Cognitive Theory***

(Social Cognitive Theories by Paul Main, May 2023)

3.4 Constructivism Theory

Constructivism views learning as the result of mental constructions. Learning takes place when new information is built and added to an individual's current structure of knowledge, understanding and skills. We learn best when we actively construct our own understanding. Constructivist learning individuals draw on the experience of the world around them in many different forms, and work to make sense of what they perceive in order to build on understanding of what they know. Social constructivism adds an important dimension to the constructivism domain. In social constructivism, the emphasis is placed upon interaction between the learner and others. Social constructivism interaction is crucial to the social constructivist. (Dastous, M, 2004).

Vygotsky looked at the social and cultural differences of each learner to help understand how a child is learning and developing. He thought that the socio-economic status and culture of a learner had a great impact on child cognitive skills. Vygotsky argued that we learn best in a social environment where we construct meaning through interaction with others, from guided learning within the Zone of Proximal Development. The Zone of Proximal Development (ZPD) has been defined as the distance between the actual development level as determined by independent problem solving and the level of potential development as through problem solving under adult guidance or in collaboration with more capable peers. Vygotsky views interaction with peers as an effective way of developing skills and strategies. He suggests that teachers use cooperative learning exercises where less competent learners develop with help from more skilful peers within the Zone of Proximal Development. He believed that "assisted learning" or what relates to direct instruction with a great deal of social interaction, is a better form of instruction than essentialism, which is an approach that posits that people within a particular group share common natural characteristics (Dastous, 2004). Vygotsky contends that learning varies across cultures rather than being a universal process driven by structures and processes.

Mathematics assessments should also serve as an instrument for development, reflecting analysis, synthesis and evaluation, as well as problem solving and communication skills. It is important to create sufficient opportunities for learners to reflect on what they are thinking and doing in Mathematics and to discuss this in an interactive situation.

Generally, learners have their own computational methods when they enter school for the first time. These methods form a foundation for the development of further structured methods. It is important

that learners understand that their own methods are valued as long as they are mathematically acceptable. All new methods should be carefully analysed in an attempt to grasp the learners' reasoning and to evaluate their progress. It is important that bilingual learners be assessed in the language used at home as well as in the language of learning to gain a complete perspective of a child's linguistics.

Figure 3.2

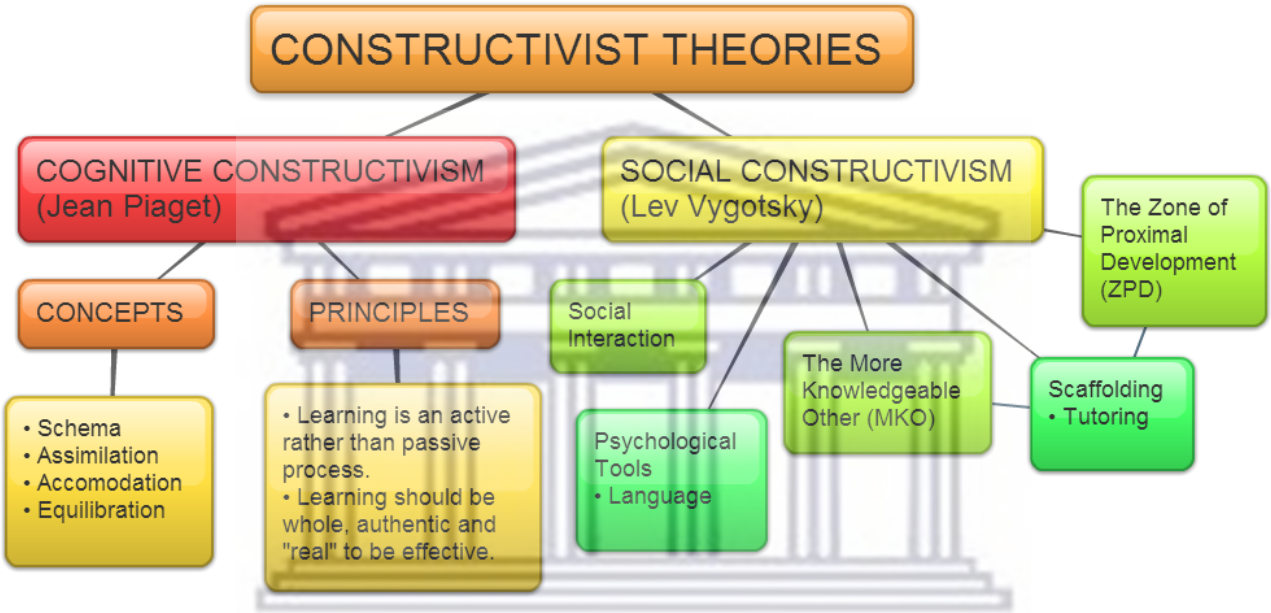

Figure 3.2: ***Diagrammatic representation of Constructivist Theories***

(Source: Embracing the Learning Theory: Constructivism by Paul Main, August 16, 2021)

3.5 School-Based Assessment

In the realm of education in South Africa's School-BasedAssessment (SBS) stands as a vital approach to evaluating learners progress and capability. This ongoing assessment, conducted within the school environment in a multifaceted process that incorporates diverse methods to gauge learners' performance. The National Protocol on Assessment (NPA) serves as the guiding framework for School-Based assessment in South Africa. The NP emphasises that the assessment should align with the curriculum and cater to the unique needs of learners.

School-Based Assessments are continuous, while the systemic assessment is a one-time event that occurs annually, usually towards the end of a particular phase. This implies that learners have more time to prepare and perform well in School-Based Assessments, whereas the systemic assessment

creates added pressure due to its infrequency.

The Systemic Assessment is a summative assessment that evaluates how much and how well learners have learned over the 3-year period in the Foundation Phase. Teachers stated that, in most cases, the School-Based Assessment (SBA) diagnostic scores are higher than the Systemic Assessment scores. The teachers perform an item analysis process with the outcome of the School-Based Assessment for each learner in the grade for Mathematics. The item analysis indicates the areas in which individuals are underperforming or performing well. The learners can thus reflect on their answers in the School-Based Assessment and teachers can use the results for intervention.

The participants further highlight that the School-Based Assessments are controlled by the grade 3 educators while the Systemic Assessment creates added pressure for both learners and teachers. The strict time constraints placed on learners during the Systemic Assessment also contribute to the learner's fear and reluctance to ask for clarity on questions they do not understand. The teachers state that the reflections on the assessment are crucial elements of effective teaching and learning in Mathematics.

3.6. Systemic Assessment

The Systemic Assessment was designed to assess the system and the phase as a whole, while other assessments are conducted quarterly to assess learners' understanding of the content taught, based on the prescribed guidelines indicated in the CAPS. The assessment helps educators to identify areas of need and set new goals to improve the education system. The Systemic Assessment is done annually to gauge the depth of knowledge and determine the compatibility between the education system and the CAPS curriculum in Mathematics and literacy.

The Systemic Assessment is used as a measuring instrument to help identify where the gaps exist and to find ways to bridge these gaps. The interviewee concurred with this, explaining that the Systemic Assessment serves to measure the performance level of learners in Literacy and Mathematics, assess the compatibility of the CAPS curriculum, and highlight the gaps in the education system. Thus, the assessment aims to provide an instrument for gauging the depth of learners' knowledge in Western Cape.

It was noted that the Systemic Assessment is essential for identifying the strengths and areas of need

of learners at in a specific grade at a specific school. Educators use the results to set new goals and zoom in on areas of need indicated the following year. The assessment is therefore used to bridge the gap and improve the education system. According to (Sayed, Y. & Jansen, J. 2014). Systemic Assessment is an essential tool in improving the quality of education in South Africa.

Systemic Assessment refers to the process of evaluating the performance of learners, teachers, and schools at the system level. It involves assessing the strengths and weaknesses of the education system as a whole, rather than just individual schools or learners. The Systemic Assessment is the process of defining, collecting, analysing, and using the information to increase learners' learning and development in Mathematics. The process of gathering data serves to enhance understanding of the strengths and weaknesses of learners' learning (Harris & Hodges, 1995).

The interviewee mentions that the school-based assessments are continuous, while the systemic assessment is a one-time event that occurs annually, usually towards the end of a particular phase. This implies that learners have more time to prepare and perform well in School-Based Assessments, whereas the Systemic Assessment creates added pressure due to its infrequency. The Systemic Assessment is a summative assessment that evaluates how much and how well learners have learned over the period of 3 years in the Foundation Phase.

Teachers stated that, in most cases, the School-Based Assessment (SBA) diagnostic scores are higher than the Systemic Assessment scores. The results afford educators an opportunity to reflect on the setting of question papers and improve on the process. The teachers do not, however, have an input on the setting of questions in the Systemic Assessment because these assessments are set by an outside provider, namely, the Western Cape Education Department, School Department Unit (SDU). The (SDU) was established in 2000 with the goal of improving teaching and learning in the South Africa school system.

The interviewee further highlighted that the School-Based Assessments are controlled by the Grade 3 educator, while the Systemic Assessment creates added pressure for both learners and teachers. The strict time constraints placed on learners during the Systemic Assessment also contribute to their discomfort and reluctance to ask for clarity.

The interview data suggests that assessment and reflection are crucial elements of effective Mathematics teaching and learning.

- **The first important element** is administering assessments to assess learners' understanding of the content taught. The assessments are then marked, and item analyses are performed to identify areas that require development which are then corrected, consolidated, and strengthened to ensure that learners grasp the concepts effectively. The assessments also serve as a form of self-evaluation and reflection on how teachers teach. According to Clarke and Hollingsworth (2002), assessment helps teachers identify areas for developing and consolidating learners' understanding of concepts. They suggest that assessments should be formative, involve self-evaluation, and provide feedback to learners. Similarly, Brookhart (2013) emphasises the importance of using assessments to promote learning and reflection. She suggests that assessments should be designed to align with learning objectives and that feedback should be timely and specific.

- **The second element** is providing learners with time to reflect on how they have learned during a Mathematics lesson. Educators can achieve this by grouping learners into ability groups and practicing questions repeatedly to introduce new methods for solving problems. Teachers also point out to learners the common mistakes they make and help them rectify these errors. Learners are given the opportunity to do demonstrations on the board, solve problems in groups and reflect on what they have learned during math class. Schön (1983) discusses the importance of reflection in practice and proposes two different types of reflection: reflection-in-action and reflection-on-action. Reflection-in-action refers to the process of reflecting on what is happening in the moment, while reflection-on-action involves looking back on an experience after it has occurred. According to Schön, both types of reflection are important for improving professional practice.

- **The third element** is providing time for learners to reflect on what they have learned during a Mathematics lesson. The educator makes use of the intervention programme and asks learners questions on the work covered. Extra time is given for slow learners to grasp the concepts. Weekly assessments, informal evaluations, and quarterly assessments are also used to evaluate learners' progress and reflect on what they have learned.

Therefore, effective Mathematics teaching and learning require a combination of assessment and reflection. Administering assessments and evaluating learners' progress can help educators identify areas of development, correct mistakes, and consolidate learners' understanding of concepts.

Providing time for reflection and demonstrations, group work, and interventions can also help learners to reflect on how they have learned and understand mathematical concepts effectively.

In the scaffolding for learning, the interviewee described various methods of supporting learners in reflecting on their results and discussing their learning. In terms of scaffolding for learning, Vygotsky's (1978) socio-cultural theory emphasises the importance of social interactions and support in learning. This is reflected in the interviewee's description of using peers to assist in scaffolding and gradually increasing the difficulty of the work. This includes differentiated oral and written questions, progressively raising the difficulty of the work, and using facial expressions, affirmation, gestures, and higher and lower questioning styles (Wood, Bruner & Ross, 1976).

The interviewee also mentioned using peers to assist in scaffolding. They emphasised the importance of asking questions from the known to the unknown and having learners familiarise themselves with the methods taught in class. Additionally, attending training and workshops on mental strategies and improving the teaching measurement concepts can also help practice across the Mathematics curriculum. Attending training and workshops to enhance teaching practices is consistent with the literature on professional development in Mathematics education (Desimone, 2009).

The teachers explained that the results are analysed in discussions at the staff and grade level. These discussions highlight the areas of need, unpack questions, and identify gaps in the weak areas. Assessment should be an integral part of the learning process, with a focus on providing meaningful feedback to students and guiding instructional decision-making (National Council of Teachers of Mathematics (2014). The interviewee emphasised that the data helps identify gaps and weak areas in the grade and phase, but do not always assist each individual learner, especially those with learning barriers, challenges, or special needs. Educators also mentioned that the assessment creates an additional workload, requires extra preparation, and generates stress and anxiety for both teachers and learners.

The interviewees argued that the Annual Systemic Assessment results are not a true reflection of the class performance due to a variety of factors such as Foundation Phase workload, pressure, overwhelming stress, and learning barriers. Finally, they emphasised that the assessment does not necessarily reflect the way teachers teach and learners learn, as many factors are at play when looking at the systemic results.

Assessment plays an important role in the process of learning and motivation. It requires the teacher to conclude findings about the learner or class learning in Mathematics but there are factors that have a negative impact on the results of the Systemic Assessment. These factors include overcrowded classes where teachers cannot give sufficient individual attention to learners, disruptive behaviour that leads to the low academic performance of learners, lack of instructional resources for both teachers and learners, to mention just a few. The large curriculum content that has to be covered and implemented is another mitigating factor. The interviewees also revealed several key challenges related to coping strategies involved in preparing learners for the Systemic Assessment. These themes include the overwhelming workload, the pressure to perform, the impact on relationships with parents, the effectiveness of the assessment, the challenges faced by teachers, and the changes that could be implemented to improve the assessment process.

One key concern that emerged is the substantial workload associated with preparing learners for the Systemic Assessment. Teachers described feeling exhausted and overworked due to the amount of extra marking, administration, and assessment required for the assessment. They also reported feeling overwhelmed by the constant scrutiny and inspection, as well as the pressure to perform well on the assessment.

Teachers described how the constant assessment and preparation required for the assessment can create poor relationships with parents, who feel pressured to do homework and study with their children to prepare them for the assessment. Teachers cope with this by work-shopping their teaching strategies with parents to help them assist their children in a proper way with homework. Parents often described themselves as being under constant stress when their children write an assessment. At times, there are high levels of absenteeism because of anxiety, and parents are emotionally connected when their children do not perform as expected.

While some teachers believe that the assessment helps learners to focus more, others described it as ineffective due to factors such as learners being over assessed and the challenges faced by learners that cannot cope with the workload. Teachers expressed concerns about the value and contribution of the Systemic Assessment to the individual learner in the grade.

Teachers also reported several challenges with the Systemic Assessment, including reading challenges, time management issues, dealing with learners who have learning difficulties, poor parental support, and a large assessment and administration load. To cope with these challenges,

teachers suggested changes such as providing extra assistance for learners, giving teachers past assessment papers to work through, and getting input from grade teachers on setting up the assessment.

Some teachers find the Systemic Assessment effective; others believe that changes need to be made to improve its quality and ease the burden on teachers.

The interview data suggests that the Systemic Assessment can be a daunting and challenging process for teachers, requiring a significant amount of extra work and assessment. Teachers claimed that the assessment has no developmental aspect, and the Western Cape Education Department uses the assessment to blame teachers. They maintained that the Systemic Assessment should be meaningful and allow opportunities for learners and teachers to learn. While some teachers find the assessment effective, others believe that changes must be made to improve its quality and purpose of the assessment and ease the burden on teachers.

3.7 Summary

Chapter three looked at the theoretical underpinning of learner's results from the Systemic Assessment in Mathematics in Grade 3. This chapter presented the theoretical framework for the study and developed the topic, the specific research problem, and the question and design element for the Systemic Assessment in Mathematics.

CHAPTER FOUR: RESEARCH METHODOLOGY AND DESIGN

4.1 Introduction

This study uses a descriptive and interpretive design that employs mixed method analysis. The participants in the study were Grade 3 teachers, currently teaching in schools. Questionnaires were used to evaluate participant's responses to determine what teaching methods they practice in the classrooms.

The importance of this study resides in its aim to identify why the Grade 3 learners' Systemic Assessment Mathematics results are not consistent with the School-Based Assessment results. The ability to teach Mathematics content is influenced by the mathematical content and pedagogical knowledge of the teachers (Piccolo, 2008). Hence, this study seeks to investigate how teachers teach mathematical skills and concepts and how learners learn them.

The Systemic Assessment for Grade 3 Mathematics is mandated by external authorities for the general purpose of accountability. There is a difference in these results when comparing them with School Based Assessment results. As stated by Newton (2007), assessments have been used for a variety of purposes, including assigning grades to learners, ensuring national accountability, monitoring systems, allocating resources within districts, determining interventions, enhancing teaching, and learning, and giving specific feedback to learners and their parents/guardians.

4.2 Research question

What are the Grade 3 learners' approaches to working in the Systemic Assessment in Mathematics?

4.2.1 Sub research questions

1. How do the responses of learners in the Systemic Assessment Mathematics reflect their learning?
2. Do learners' ways of working in the Systemic Assessment Mathematics reflect the way teachers teach Mathematics in the classroom?

4.3 Research methodology

For the purposes of this study a mixed methods design was selected. The quantitative method suggests that the knowledge the learners have gained in the classroom is directly reflected in the scores obtained in the Systemic Assessment. The qualitative method illuminates how learners approach the questions in the Systemic Assessment, providing insights into the teaching methods employed by educators in the classroom. The mixed method approach afforded the researcher a larger and more comprehensive range of information; yielding data on how and what questions were answered. The findings will contribute to the understanding of the research problem in a holistic way. Furthermore, they will deepen and sharpen the teachers' understanding of the education system.

The study embarked on primary data collection to obtain firsthand information. Data collection was by means of classroom observation, semi-structured interviews and questionnaires for the teachers to provide effective cause or explanation of the problem. The study used thematic analysis. which entails looking for patterns and themes to organise the data and to discover useful information to support the research questions.

4.4 Research setting

The research setting is the physical, social, or experimental context within which research is conducted (Davis, 2021). In the qualitative research component of this study, the research setting was the two schools which were the institutions where the data was collected.

4.4.1 School Number 1 Background

School number 1 is a quintile 5 public primary school from grade R to grade 7, located in the Metropole South district. The school is about 33 years old with a population of 971 learners and 33 teachers. The school has a cultural diversity that encompasses various religious and racial backgrounds, mostly Christianity and Muslim. There are three diverse languages in the system, namely, English, Afrikaans and IsiXhosa. English is the language of learning and teaching (Lolt) at the school. It is the Home Language of plus/minus 70 percent of the learners, while 20 percent of the learners speak Afrikaans, and 10 percent speak IsiXhosa. The two Grade 3 class teachers have an average of 30 years teaching experience between them. The school accommodates both girls and boys in the system. The school day starts at 8:00 a.m. and ends at 2:45 p.m. and the school

implements the National Curriculum Statement (NCS). The National Curriculum Statement Grade R-12 gives expression to the knowledge, skills and values worth learning in South Africa.

4.4.2 School Number 2 Background

School number 2 is a quintile 5 public primary school from grade R to grade 7 in the Metropole South district. The school is about is 44 years old and it was the only primary school in the area for 10 years before the second primary school was build. It has a population of 987 learners and 31 teachers. The school has a cultural diversity that derives from various religious and racial backgrounds, mostly Christianity and Muslim. It has three diverse languages in the system: English, Afrikaans and IsiXhosa. English is the language of learning and teaching (Lolt) at the school. It is the Home Language of plus/minus 80 percent of the learners. The two Grade 3 class teachers have an average of 15 years teaching experience, they are relatively young teachers in the grade.

The school accommodates both girls and boys in the system. The school day starts at 8:00 a.m. and ends at 2:45 p.m. The school implements the National Curriculum Statement (NCS). The National Curriculum Statement Grade R-12 gives expression to the knowledge, skills, and values worth learning in South Africa.

Both sample schools have the same social and communal background. The schools accommodate learners from the informal settlement in the area. The learners from the informal settlement comprise 10 percent of the school's population. The learners from the informal settlement have various social concerns including major academic challenges which also have an impact on the results of the systemic assessments. There is a language barrier as most of the questions are posed in English.

4.5 Data collection approaches

4.5.1 Qualitative research

The qualitative component of the study allowed the researcher to investigate and gain an in-depth understanding of the information gained about the learners' way of working. Qualitative research has many strengths; it is flexible, highly focused, and designed to be completed rapidly because the results are seen or heard first-hand. Qualitative research serves as a measure of the quality of a study. It assesses the credibility of the data and the subsequent analysis. Qualitative research involves

determining the credibility and trustworthiness of the data and the data analysis. Guba and Lincoln (1985) rely on four general criteria in their approach to trustworthiness. These are credibility, transferability, dependability, and conformability.

4.5.2 Quantitative research

Quantitative research is the process of collecting and analysing numerical data. This research method can be used to find patterns, make predictions, assess relationship and generalise results to the broader population. Quantitative research is deeply rooted in numbers and statistics and has the ability to effectively translate data into easily quantifiable charts and graphs. The quantitative paradigm is based on positivism, a research method that prefers questionnaires, structured interviews and experiments. The positivist perspective in education looks to internal or external influences on individuals as the primary cause of learning behaviour. The qualitative data was analysed via thematic content analysis.

4.5.3 Differences in approaches.

Quantitative	**Qualitative**
Analysis focuses on the use of numerical methods such as mathematical or statistical procedures to ascertain magnitude, amount, or size.	Analysis focuses on the nature of phenomenon. It is represented by pattern and themes, and is stored (Rogers et al., 2011:271).
Data is based on numbers, or meaning is derived from numbers.	Data is based on words or meaning expressed through words.
Data collection is standardised, and data was gathered in numerical format.	Data collection is not standardised and it is classified into categories.
Data analysis diagrams and statistical outcomes are used.	Data analysis is derived from conceptual methods.

Table 4.1*: The differences between qualitative and quantitative research methods.*

(Source: Streefkerk, R., 2023, June 22)

4.6 Research paradigm

4.6.1 Interpretive paradigm

The interpretive paradigm is underpinned by observation and interpretation. Thus, to observe is to collect information about events, while to interpret is to make meaning of that information by drawing inferences from or judging the fit between the information and some abstract pattern (Aikenhead, 1997).

This paradigm was deemed appropriate for the research as it focuses on the meaning of the study and employs different methods in order to reflect different aspects of the study. The interpretive approach is based on naturalistic approaches of data collection such as, interviews and observations. In the interpretive paradigm, the aim of human sciences is defined as understanding people. The interpretive paradigm relates to constructivism because it emphasises the ability of the individual to construct meaning. A phrenologist promotes the "need to consider [the subjective interpretations of] human beings" and their perceptions of the world, as our starting point in understanding social phenomena. From the constructivist viewpoint, people constantly understand, create, and give meaning to, describe, validate, and explain their actions (Fay, 1975:94). Interpretivism is a more people centred approach which acknowledges the research integration within the research environment, where each individual will impact on the perception and understanding of the other (Morrison, 2002:18).

Furthermore, it focuses more on understanding the phenomena in this study situation, which in the context of this study are the responses of learners in the Annual Systemic Mathematics Assessment. The qualitative paradigm is based on interpretivism (Altheide & Johnson, 1994) combined with constructivism (Guba & Lincoln, 1994). The choice to use an interpretive paradigm in this research is based on the belief that the participants become actively involved in all the phases of the processes (De Vos, et al, 2011) According to Willis (1995) interpretivists are anti-foundation lists, who believe there is no single correct route or particular method to knowledge.

According to Creswell (2007, p. 20), participants seek understanding of the world in which they live. The teachers and learners in Grade 3 need to be able to identify the areas of the Mathematics in which they performed well or underperformed, in terms of their responses in the Systemic Mathematics Assessment. Interpretive approaches gave the researcher greater scope to address issues

of influence and impact and to ask questions such as ‘why’ and ‘how’. Walsham (1995) presents three different uses of the theory in interpretive case studies: theory as a guide for the design and collection of data; theory as an interactive process of data collection and analysis; and theory as an outcome of the case study. The use of theory as an iterative process between data collection and analysis has been applied in this research study.

4.7 Data collection techniques

4.7.1 Questionnaires

According to Roger et al. (2011:238), questionnaires are a well-established technique for collecting demographic data and participants’’ opinions. Questionnaires are common means of obtaining information from participants. Questionnaires are versatile, cost-effective research tools (Walliman, 2001) and are useful for collecting primary qualitative data. In this study, the questions posed in the questionnaires were unambiguous and set out to collect facts or information from human respondents as honestly as possible. Open-ended questions allowed respondents to express their views using their own sentences and descriptions. In semi-structured interviews the researcher prepares both open-ended and closed ended theme questions but allows participants to share information, feelings, experiences, and emotions in conversation.

4.7.2 Interviews

Interviews were deemed a suitable data-collection method for acquiring detailed information for this research. To gain an in-depth understanding of perceptions or opinions on the topic, this study made use of structured interviews with focus group. Two Grade 3 educators at each of the two schools from the same circuit in the Metropole participated in the focus groups. The discussion among the group of teachers about the topic was to obtain opinions that could be used for further research. The interviews took place before and after the annual Systemic Assessment. These interviews were linked to the positive research paradigm which suited a quantitative methodology. Using this approach, the data collected were easily converted to numerical data for statistical analysis because the responses were often pre-coded.

Structured interviews are sometimes known as standardised interviews (Fielding & Thomas, 2008). According to Preece, Rogers and Sharp (2002), structured interviews are most appropriate when the

goals of the study are clearly understood and specific questions can be identified.

The process proposed by Oliver and colleagues (Oliver et al., 2005) was used to guide the transcription of the interview. In this way we ensured that participants' statements were clearly captured. The results of the interviews were transcribed, translated, and coded to produce themes. The recording of the interview data took place by means of note taking. The time and dates of school visits were scheduled according to the school schedule and the researcher's time availability. Within that time period, semi-structured interviews were conducted, documented and analysed.

4.7.3 Observation

Observation as a data collection method can either be structured or unstructured. In structured observation, data collection is conducted using specific variables and according to a predefined schedule. Unstructured observation, on the other hand, is conducted in an open and free manner in a sense that there would be no predetermined variables or objectives. The observations were recorded in a descriptive method, making notes while teachers were teaching the lessons.

The notes recorded observations of the classroom setting and the type of activities learners performed during the Mathematic lessons, as well as how learners responded to mathematical questions techniques and methods used by the teachers; how learners applied their numeracy skills to activities in the class; how learners behaved during the lessons and how they reflected on the feedback of the activities. The direct observations were conducted in the selective Grade 3 classes to gain an understanding of the learning in its natural setting. Direct observation is a method of watching and collecting data from something you observed directly. This method of data collection is used to gather both qualitative and quantitative data as numbers. The researcher could explore how learners learned, how they interpreted and made sense of the concept in Mathematics, where they struggled, what they did or how they responded when they did not understand the focus area.

4.7.4 Lesson Observation

The observation was intentional to observe the lesson presentation and the response of the learners. It helped the researcher to focus on what the teacher and learners actually did and what they said. The researcher had the research questions and observation questions prepared in order to guide the note taking while observing a Mathematics lesson. The observation lasted for an hour per class. At the

beginning of the lesson concepts were explained to provide clarity on mathematical terminology and aspects. The lessons were divided into three parts. For the first ten minutes, the teacher gave a brief overview of the previous lesson. Learners did mental math for 10 minutes and counting for a further ten minutes. Most of the time was devoted to the lesson which largely dealt with multiplication, adding, basic operation and fractions. The teacher had to follow a curriculum Mathematics programme prescribed according to the Curriculum and Assessment Policy Statement (CAPS) document. The learners counted and performed mental Mathematics as stipulated in the Annual Teaching Plan (ATP) for that particular week.

The planned lessons showed a systemic and logical sequence of activities that led learners to attain most of the lesson objectives. The planning and delivery of lessons did not exhibit much mathematical skill. All four teachers gave "teacher strategies" on how to get to the answers of the operation or solve problems. Learner strategies were not encouraged much, nor were they addressed. The lesson topic tied in with the current curriculum and built on the work that was completed earlier. Revision took place before a new lesson was presented but only the learners whose hands were up were asked to answer. In one class the planning included some differentiation for different groups but in the other three classes no differentiation was planned or presented for the different learning needs. The researcher tried to interact with a few of the learners after each lesson by asking questions concerning their Mathematics activities. The quality of classroom teaching practice was good, educators established the pacesetting for the subject which meant that time was allocated for the different concepts of Mathematic.

The prepared research questions focused on what and how learners learn during the lessons. In all four Grades 3 classes more or less 80 percent of learners showed an interest in the learning activities. The remaining 20 percent were lost in their own worlds. The researcher was not sure if they did not understand the mathematical concept or were not stimulated. Only a limited number of learners participated in and contributed to the mathematical knowledge by interacting with the teacher. At times instructions on how to complete a mathematical activity were not clear. Hence, learners would give or write incorrect answers to the questions. Misunderstanding of certain content was not always immediately addressed.

The most common learning styles in the four Grade 3 classes were the visual, reading, writing, and auditory styles. The visual style learners relate best to written information, notes, and pictures. With the reading and writing styles learners got their information from reading and responded to the

information example the story sums. The auditory learners would read the story sums aloud, would shout when the classes did counting and even shouted out the answers.

Much of the Mathematic lessons were focussed on story sums with all the basis operations. The story sums that might arise in the Systemic Assessments were suggested by the Curriculum Advisors (CA) of the Foundation Phase of both schools. All four Grade 3 teachers concentrated in depth on the story sums that were proposed to the Grade 3 classes. The researcher got the impression that the learners struggled with the understanding of the basic operation in the story sum. The teacher would select some pupils and order them to tackle questions on the blackboard; in most cases it would be the same learners.

All four teachers demonstrated knowledge of the subject but did not use effective range to teach the mathematical concept. This resulted in confusion and the teacher gave up on the lesson because learners could not get to the answers. In order to support learners to achieve good results for the Mathematic Systemic Assessment, teachers were teaching purely to prepare learners to answer systemic assessment, and not teaching the curriculum. In some classes effective teaching did not happen because of pressure, demands and time constraints.

4.8 Purposive sampling

McMillan and Schumacher (2014) state that sampling is the initial search for information-rich respondents, groups, places, and events from which sub-units must be selected for a broader study. Purposive sampling is a technique used by researchers whereby participants are deliberately chosen because of their suitability to advancing the purpose of the research (Rule et al., 2011:64). Purposive sampling is based on selecting participants who best suit the specific purpose associated with answering the research question (Teddlie & Yu 2007:77). This study made use of purposeful sampling. According to Cohen, Manion, Morrison, (2007), purposive sampling is a process in which the researcher deliberately excludes the larger population and deliberately includes a smaller population to reach the desired in-depth comprehension of the research problem.

Purposive sampling aided the researcher to focus on key informants who were particularly knowledgeable of the phenomenon for investigation, thus providing in-depth findings about the investigations (Anney, 2014:278). All the participants in this study were purposively sampled based on the teaching and learning performance in Systemic Assessment Mathematics.

The target group for this research was a group of Grade 3 learners from each of the two sample schools that participated in the research. Two Grade 3 educators in each of two schools in the same circuit were interviewed and observed. These two educators also completed questionnaires pertaining to the research. The collection of the data was unbiased and objective, which means that each conclusion was arrived at to the best of the researcher's ability and without introducing the researcher's own vested interest.

SCHOOL TYPES FOR OPEN SCHOOLS 2021 – PER EDUCATION DISTRICT			
SOURCE: CURRENT STATUS (CEMIS)			
CONTROL: PUBLIC / SECTOR: ALL			
EDUCATION DISTRICT	**SCHOOL TYPE**	**SCHOOLS**	**LEARNERS**
METRO SOUTH	Combined School	1	981
	Intermediate School	5	5 994
	Primary School	142	129 955
	School of Skills	2	982
	Secondary School	55	61 172
	Special School	7	1416
	Youth Centre	1	28
METRO SOUTH		**213**	**200 528**
TOTAL		**213**	**200 528**

Table 4.2*: School types in the Metro South District*

(Source: Centralised Educational Management Information System (CEMIS / WCED)

Table 4.2 above, shows the number of schools and the number of learners in the Metro South

The sample for this study was drawn from just two primary schools and Grade 3 learners in a particular suburb. The purposive sample, which is derived from Table 4.2. (above) is presented in Table 4.3. below.

Education District	Suburbs	School Type	School	Learners	Foundation Phase Learners	Number of Grade 3 Learners
Metro South	Strandfontein	Primary. S	School 1	913	354	119
Metro South	Strandfontein	Primary. S	School 2	951	351	126

Table 4.3: ***Sample of schools for analysis.***

(Source: Department of Basic Education: Western Province)

The table above (Table 4.3) provides a visual representation of the two primary schools that participated in the study. Together they have a total number of 245 learners in Grade 3. The schools are labelled by the WCED as schools in the ordinary sector and are listed as public schools. For this study, the Systemic Assessment results of these two specific schools exclusively will be analysed. Furthermore, the study will only focus on the teaching and learning of Mathematics in Grade 3 in the schools in Table 4.3 above.

4.9 Purpose of the Systemic Assessment

The Systemic Assessments enable the education system to assess achievement of knowledge values and attitude (SKVAs) and assess the curriculum and determine if it is being covered. Systemic Assessment helps to gauge the level of the Grade 3 learners' performance in terms of literacy and numeracy in the Western Cape. It is used as an instrument to measure the standard of Mathematics for Grade 3 and to check if the education system is compatible with the CAPS curriculum. The assessment is also useful for revealing where the gaps are and finding ways to bridge these gaps. Systemic Assessment also contributes to our understanding of the strengths and areas of need of the learners at a particular school in a specific grade and helps educators to set new goals and focus on the indicated areas of need the following year.

Given the low performance in Mathematics and Literacy, the Western Cape Education Department introduced the Systemic Assessment in an attempt to improve the performance of the learners, schools and districts. The purpose of the Systemic Assessment is to measure the level of the learners and determine whether the school is an underperforming school or a performing school. The assessment also allows the teachers to know which areas they must revise, consolidate and start improving the grade and phase performance.

The results of the School-Based Assessments, informal and formal assessments at school, differ from the results obtained in the Systemic Assessment. The School-Based Assessments are ongoing, while the Systemic Assessment takes place once a year and the quality of questions are set on a high level.

Assessments at school are controlled by the Grade 3 educator at the particular school. The Systemic Assessment creates significant added pressure for the Grade 3 learners and teachers because of curriculum coverage the before the assessment. The questions set usually differ and the strict time constraints place pressure on learners who feel uncomfortable and regularly have to ask for clarity. An immense amount of pressure is placed upon learners to perform well. The Systemic Assessment is usually undertaken in the third term towards the end of a particular phase (e.g., Grade 3 and Grade 6 - End of Foundation and Intermediate Phase) to assess the system and the phase. However, other assessments conducted quarterly, assess the learner's understanding of the content taught, based on the prescribed guidelines and milestones indicated in the CAPS. The purpose of the System Assessment is to measure the learner's performance as well as the context in which learner's experience learning and teaching.

4.10 Data analysis

The process of data analysis uses analytical and logical reasoning to gain information from the data collected. The main purpose of data analysis is to find meaning in data so that the derived knowledge can be used to make informed decisions. The motive behind data analysis in research is to present accurate and reliable data. After the data is prepared for analysis, I will be using different research and data analysis methods to derive meaningful insights on my proposal. Content Analysis was used to analyse documented information from the Systemic Assessment results. Narrative Analysis was also used to analyse content gathered from various sources such as personal interviews, field observations, and surveys, to find answers to my research questions. Furthermore, the researcher realised that if the data were not analysed immediately, they might easily have become distorted because the context for some issues that were raised were forgotten, hence increasing the likelihood of incorrect interpretation (McMillan & Schumacher, 2006).

In terms of this study, the quantitative analysis will show the results and performance in particular topics in Mathematics in Grade 3, through class observation, questionnaires and semi- constructive interviews. Outcomes will be expressed as percentages and scores. The topics will be further refined to specific mathematical concepts or learning outcome related to the CAPS curriculum. These data

scores will then be analysed qualitatively, connecting the performance in the assessment to the ways of doing Mathematics, which will be visible in the learners' responses. To respond to the research questions, the teaching and learning of Mathematics in the Grade 3 classroom in the selected schools will be scrutinised. For this, the researcher will make use of classroom observation and questionnaires, which will be given to the teachers teaching Grade 3 learners as well as subject advisers working in this suburb.

This study used thematic analysis of the data collected from the two sample neighbouring schools. The four Grade 3 classes at the selected schools were visited for observation a mathematical lesson once a week for four weeks. Most of the classes were under resourced. The observation notes and remarks were compiled and organised by the researcher.

The Grade 3 educators were given a questionnaire which they could complete in their own time within a period of two weeks. This time frame was given to allow the educators time to reflect on their teaching method and learning of the learners. Each of the four Grade 3 educators from the two sample schools participated in an individual interview. Each session took approximately 20-30 minutes. The researcher posed the questions and the educators were required to write down their own answers according to their understanding of the questions. In instances where answers were not clearly understood or interpreted, a follow up interview was held.

4.11 Thematic data Analysis

This study used thematic analysis of the data collected from the two sample neighbouring schools. The thematic analysis is a method for analysing qualitative data that involves reading through the set of data and identifying patterns in the meaning of the data to find the themes.

The Annual Systemic Assessment is different from other assessments conducted at the school level due to its infrequency, higher level of questions, and added pressure on both learners and teachers. The systemic assessment is designed to test the system and the phase, while other assessments are conducted quarterly to test learners' understanding of the content taught based on the prescribed guidelines indicated in the CAPS. The interviewees highlight the differences between the Systemic Assessment and other assessments conducted at the school level.

The participants' responses (captured in Table 4.4) indicate that the Systemic Assessment is an important tool for measuring the performance of learners in Literacy and Mathematics. The assessment helps educators to identify areas of need and set new goals to improve the education system. The Systemic Assessment is done annually to gauge the depth of knowledge and determine the compatibility of the CAPS curriculum.

Theme	**Discussion /Comment of participant teachers**
Theme 1: Purpose of Systemic Assessment	The interviewee explained that the annual Systemic Assessment serves to measure the performance level of learners in Literacy and Mathematics. It helps to identify existing gaps in the education system and assess its compatibility with the CAPS curriculum. The assessment aims to provide an instrument for gauging the depth of learners' knowledge in Western Cape. The Systemic Assessment process gathers relevant information about Grade 3 learners' performance in Mathematics and to determine the learners' interest about their method of learning.
Theme 2: Importance of Systemic Assessment:	The interviewee noted that the Systemic Assessment is essential for identifying the strengths and areas of need of learners at a specific school and grade. Educators use the results to set new goals and zoom in on areas of need indicated the following year. The outcome of the assessment is used to bridge the gap and improve the education system. According to Sayed, Y. & Jansen, J. (2014), Systemic Assessment is an essential tool in improving the quality of education in South Africa. Systemic Assessment refers to the process of evaluating the performance of learners, teachers, and schools at the system level. It involves assessing the strengths and weaknesses of the education system as a whole, rather than just individual schools or learners. The Systemic Assessment enables teachers to measure the effectiveness of their teaching by linking it to learner's performance.

Theme	Discussion /Comment of participant teachers
Theme 3: Frequency of Systemic Assessment:	The interviewee agreed that the Systemic Assessment is conducted annually to measure the standard and determine if the education system is compatible with the CAPS curriculum.
Theme 4: Understanding of Systemic Assessment:	The interviewee described Systemic Assessment as a tool to measure the education system's effectiveness in covering the curriculum. It is an instrument for identifying gaps and improving the system. The Systemic Assessment is the process of defining, collecting, analysing, and using the information to increase learners learning and development in Mathematics. The process of gathering data to better understand the strengths and weaknesses of learners learning. (Harris & Hodges, 1995).
Theme 5: Frequency and Timing of Assessments:	The interviewee mentions that the school-based assessments are continuous, while the systemic assessment is a one-time event that occurs annually, usually towards the end of a particular phase. This implies that learners have more time to prepare and perform well in school-based assessments, whereas the systemic assessment creates added pressure due to its infrequency. The Systemic Assessment is a summative assessment evaluated how much and how well learners have learned over the period of 3 years in the Foundation Phase.
Theme 6: Quality and Level of Questions:	The interviewee notes that the questions asked in the systemic assessment are of a higher level than those in the school-based assessments. This indicates that the systemic assessment is designed to assess the system and the phase as a whole, rather than just the learners' understanding of the content taught. Teachers stated that the School-Based Assessment (SBA) diagnostic scores are in most cases higher than the Annual Systemic Assessment scores. The teachers perform an item

Theme	Discussion /Comment of participant teachers
	analysis process with the outcome of the School-Based Assessment for each learner in the grade in Mathematics. The item analysis indicates in which areas the individuals are underperforming or performing well. The learners can reflect on their answers in the School-Based Assessment and teachers can use the results for intervention. Teachers have an opportunity to reflect on the setting of question papers and improve on it. The educators do not have an input on the setting of question in the Systemic Assessment because it is done by an outside provider the Western Cape Education Department, School Department Unit (SDU).
Theme 7: Control and Pressure:	The interviewee further highlights that the school-based assessments are controlled by the grade 3 educator, while the systemic assessment creates added pressure for both learners and teachers. The strict time constraints placed on learners during the systemic assessment also contribute to their discomfort and reluctance to ask for clarity.
Theme 8: Assessment and reflection:	The interview data suggests that assessment and reflection are crucial elements of effective Mathematics teaching and learning. The first important element is administering assessments to assess learners' understanding of the content taught. The assessments are then marked, and item analyses are done to identify areas of development, which are corrected, consolidated, and strengthened to ensure that learners grasp the concepts effectively. The assessments also serve as a form of self-evaluation and reflection on how teachers teach. According to Clarke and Hollingsworth (2002), assessment helps teachers identify areas of development and consolidate learners' understanding of concepts. They suggest that assessments should be formative, involve self-evaluation, and provide feedback to learners. Similarly, Brookhart (2013) emphasizes the importance of using assessments to promote learning and reflection. She suggests that assessments should be designed to align with learning objectives and that feedback should be timely and specific.

Theme	Discussion /Comment of participant teachers
	The second element is providing learners with time to reflect on how they have learned during a Mathematics lesson. Educators can achieve this by grouping learners in ability groups and practicing questions repeatedly to introduce new methods for solving problems. Teachers also show learners common mistakes they make and help them rectify them. Learners are given the opportunity to do demonstrations on the board, solve problems in groups and reflect on what they have learned during math class. Schön (1983) discusses the importance of reflection in practice and proposes two different types of reflection: reflection-in-action and reflection-on-action. Reflection-in-action refers to the process of reflecting on what is happening in the moment, while reflection-on-action involves looking back on an experience after it has occurred. According to Schön, both types of reflection are important for improving professional practice. The third element is providing time for learners to reflect on what they have learned during a Mathematics lesson. The educator makes use of the intervention program and asks learners questions on the work covered. Extra time is given for slow learners to understand the concepts. Weekly assessments, informal evaluations, and quarterly assessments are also used to evaluate learners' progress and reflect on what they have learned. Therefore, effective Mathematics teaching and learning require a combination of assessment and reflection. Administrating assessments and evaluating learners' progress can help educators identify areas of development, correct mistakes, and consolidate learners' understanding of concepts. Providing time for reflection and demonstrations, group work, and interventions can also help learners to reflect on how they have learned and understand mathematical concepts effectively.
Theme 9:	The interview data is divided into two main themes: scaffolding for

Theme	Discussion /Comment of participant teachers
Scaffolding for learning:	learning and assessment in Mathematics. In the scaffolding for learning theme, the interviewee describes various methods of supporting learners in reflecting on and discussing their learning. In terms of scaffolding for learning, Vygotsky's (1978) socio-cultural theory emphasizes the importance of social interactions and support in learning. This is reflected in the interviewee's description of using peers to assist in scaffolding and gradually increasing the difficulty of the work. This includes posing differentiated oral and written questions, gradually increasing the difficulty of the work, and using facial expressions, affirmation, gestures, and higher and lower questioning styles (Wood, Bruner, & Ross, 1976). The interviewee also mentions using peers to assist in scaffolding. They emphasize the significance of setting questions that progress from the familiar to unfamiliar, urging learners to acquaint themselves with the standards in Mathematics. This enables them to assess the compatibility of the education system with the CAPS curriculum. Additionally, attending training and workshops on mental strategies can also help and benefit improving the teaching of measurement concepts and enhance knowledge across the Mathematics curriculum. Attending training and workshops to improve teaching practices is consistent with the literature on professional development in Mathematics education (Desimone, 2009). The teachers realised that a supportive learning environment provided benefits for learners to learn better.
Theme 10: Assessment in Mathematics:	In the assessment in Mathematics theme, the interviewee discussed the diagnostic results of the Systemic Assessment. They explained that the results are analysed by holding discussions at the staff and grade level, highlighting the areas of need, unpacking questions, and identifying gaps in the weak areas. Assessment should be an integral part of the learning

Theme	Discussion /Comment of participant teachers
	process, with a focus on providing meaningful feedback to students and guiding instructional decision-making (National Council of Teachers of Mathematics, 2014). The interviewee emphasised that the data help identify gaps in weak areas in the grade and the phase as a whole, but do not always assist each individual learner, especially those with learning barriers, challenges, or special needs. They also mentioned that the assessment adds workload, requires extra preparation, and creates stress and anxiety for both teachers and learners. The interviewee argued that the Systemic Assessment results are not a true reflection of the class performance due to various factors such as intermediate and senior (intersen) work, increased pressure, overwhelming stress, and existing learning barriers. Finally, they mention that the assessment does not necessarily reflect the way teachers teach or how learners learn, given the multiple factors that must be accounted for when looking at the systemic results. Assessment plays an important role in the process of learning and motivation. It requires a teacher to make findings about the learner or class learning in Mathematics, however there is factors that have a negative impact on the results of the Systemic Assessment. One such factor is overcrowded classes where teachers cannot give much individual attention to learners. Disruptive classroom behaviour is another factor that contributes to low academic performance. In addition, the curriculum content is broad, and a great deal of content needs to be covered and implemented. This, along with a lack of instructional resources for both teachers and learners, also impacts the results achieved in the assessment. The interviewee provided insights into scaffolding methods and the challenges and limitations of the Systemic Assessment in Mathematics. They stressed the importance of supporting learners in a way that suits

Theme	Discussion /Comment of participant teachers
	their learning style and addressing the gaps in weak areas. The interviewee also highlighted the need to consider various factors that may influence the assessment results and the impact on learners and teachers. They suggested that participating in training and workshops on mental strategies, as well as teaching fractions, sharing, and measurement concepts more effectively can improve practice across the Mathematics curriculum. They recommended that teachers provide support to colleagues who might struggle to teach a mathematical concept in the same grade. The interviewees' revealed several key challenges related to coping strategies involved in preparing learners for the Systemic Assessment. These themes include the overwhelming workload, the pressure to perform, the impact on relationships with parents, the effectiveness of the assessment, the challenges faced by teachers, and the changes that could be made to improve the assessment process.
Theme 11: Overwhelming workload:	One key theme that emerged is the overwhelming workload associated with preparing learners for the Systemic Assessment. Teachers describe feeling exhausted and overworked due to the amount of extra marking, admin, and assessment required for the assessment. The interviewees also reported feeling overburdened by the constant scrutiny and inspection, as well as the pressure to perform well on the assessment
Theme 12: The impact of the assessment on relationships with parents:	Teachers described how the constant assessment and preparation required for the assessment can create poor relationships with parents, as parents feel pressured to help with homework and study with their children in order to prepare them for the assessment. Teachers cope with this by work shopping parents on their teaching strategies to help them assist their children in a proper way with homework. Parents often described themselves as being under constant stress when

Theme	Discussion /Comment of participant teachers
	their children write an assessment. At times high absenteeism is experienced because of learner anxiety, and parents are impacted emotionally when their children do not perform as expected.
Theme 13: Effectiveness of the Annual Systemic Assessment:	While some teachers believe that the assessment helps learners to focus more, others described it as ineffective due to factors such as Covid -19 and the challenges confronting the weaker learners. Teachers also expressed concerns about the quality of the assessment and suggested that retired Grade 3 teachers should mark it instead of people outside the teaching profession. Teachers also report several challenges with the Systemic Assessment, including reading challenges, time management, dealing with learners who have learning difficulties, poor parental support, and too much assessment and admin. To cope with these challenges, teachers suggest changes such as providing extra assistance for learners, giving teachers past assessment papers to work through, and getting input from grade teachers on setting up the assessment. Some unions claim that the children are over assessed, and that intervention improves the system, not the Systemic Assessment. Teachers claim that the assessment has no development aspect, and the Western Cape education department uses the assessment to blame teachers for learner's poor performance. The interview data suggests that the Systemic Assessment can be a daunting and challenging process for teachers, requiring a significant amount of extra work and assessment. While some teachers find the assessment effective, others believe that changes need to be made to improve its quality and ease the burden on teachers.

Table 4.4*: Thematic Analysis*

(Source: Author's own compilation)

4.12 Data Collection Procedure

Data collection is a systematic process of gathering information through observations or measurements via research. For this study, data was collected, processed and the results presented in a manner that transferred the most important aspect of the research. The data simultaneously answered the research question (Carcary 2009:13; Hancock et al., 2009:15).

The aim of the data collection was to enable the researcher to take decisions related to the information available and to understand how helpful the information will assist in carrying the research forward. This study generated both qualitative and qualitative data. The qualitative data was analysed by means of thematic analysis, as pertains to the analysis of data recording to themes and emergent categories (Hancock et al. 2009:31; Jane, 2003:220).

Bogdan and Biklen (2003) define qualitative data analysis as working with the data organising them breaking them into manageable units coding them synthesising them and searching for patterns.

The process of the data analysis starts with the categorisation and organisation of the data in search of pattern, themes and meaning that came from the data. A process sometimes referred to as "open coding" (Strauss & Corbin, 1990) is commonly employed, whereby the researcher identifies and tentatively names the conceptual categories into which the phenomena observed would be grouped. Braun and Clarke (2006:79) explain thematic analysis as a method of dealing with qualitative data, analysis and/or phrases that capture something important about the data in relation to the research question and present some level of patterned response or meanings within the data set

Thematic analysis involves various steps that set out the logical sequence for analysis qualitative data. The following steps were followed in analysis the data for this study (De Vos 2002, p. 340; Henning et al. 2004, p. 104-105; McMillan & Schumacher 2001, p. 460):

- Obtaining data
- Organising data
- Reading and writing memos
- Coding data
- Categorisation of themes

- Interpretation of data

Data was collected from a sample of 5 Grade 3 educators and 4 Grade 3 classes at two Metropole South schools in the same circuit in the Western Cape. The data was collected from educators by using interviews, questionnaires and observing of Mathematic lesson in the classrooms. The gathering of the data is the process to measure information on targeting variables in an established system which then enables the researcher to answer the research question and evaluate outcomes.

The questions in the interview were semi-structured to get as much information from participant without restricting them. The acquired hard copy data from the participants was organised accordingly. The available data was transcribed for the researcher to analyse it.

4.13 Evaluating the data

The various categories that emerged from the outcome of the categorisation of the themes, themes served as the basis of the research. The findings that were interned and discussed to find the answer to the research question.

Goals were set for how the researcher wanted the data to be used and why the particular data was important for the researcher and the study. The data can help researcher to further refine the data collection and state why the data is important to the research.

Accurate measurement is important for data collection because it can help the researcher make sound decisions. The combination of qualitative and quantitative data was useful for decision-making. The qualitative data indicates that the learning approach in Grade 3 classes had an impact on the Systemic Assessment in Mathematics results referred to in Table 4.12. The data-based opinion was derived from the data collected for the four weeks from the Grade 3 classroom at the two schools and the responses from the learners during observation in classes, interviews and questionnaires. Did the data cover the researchers' who, what, when and how requirements?

Who collected the data?

The researcher collected reliable data from the schools during the teaching hours of the Grade 3 educators. The data is trustworthy because it was collected first hand by the researcher herself.

Educators and learners were present during lesson times.

How was data Integrity insured?

The integrity of the data was not compromised as there was a four-week measurement against the information received.

When was data collected?

Data was collected over a period of two months; four weeks for class observation and four weeks for semi structured interviews and questionnaires with the teachers.

How was the data collected?

The data was collected by means of questionnaires, interviews and observation.
Quantitative and qualitative methods were used to collect data.

Data interpretation should seek to serve three purposes, firstly, making sense of the data; secondly, corroboration of exiting theories; and thirdly, enhancing or questioning existing theories (McMillan& Schumacher 2001, p. 460)

- When examining the data, the researcher noticed a pattern. The pattern revealed that the Systemic Assessment is a summative assessment evaluating how much and how well learners have learned over the period of 3 years in the Foundation Phase.
- Based on the pattern identified in the data collection, the researcher predicts that Systemic Assessment results are not a true reflection of the class performance due to various factors such as grade 4 Mathematic curriculum questions included in the Systemic Assessment Mathematic paper.
- Similarities and differences between School–Based Assessment and Systemic Assessment were noted. The similarities are that all learners are assessed, but the differences lie in the results which in the SBA results are those of the individual learners and in the SA, the results are for the class, school and district.
- A possible explanation for what the data showed is that learners build on previous knowledge.

On reflecting on the Grade 3 Systemic Assessment Mathematic sample paper, the question level of

the Mathematics assessment was a challenge. Not all the content was appropriate for the Grade 3 level learner. The higher order questions were challenging. The context was sometimes not familiar to the learners.

4.14 Recommendations

Extra assistance would be great. Each Grade class needs highly skilled trained and competent assistant tutors to provide one on one assistance for the challenged learners. Teachers must be supplied with past systemic assessment papers to work through and familiarise themselves with the questioning techniques and styles. The teacher has no idea of the structure and the set of the actual systemic assessment. Grade teachers should give input to those who set the assessments. The researcher suggests that the assessment be done over a longer period of time, not on one day. It is also recommended that the actual Grade 3 Systemic Assessments be dropped and that replaced by a yearly assessment for each grade, like the ANA assessment. This will also encourage teaches to improve their teaching styles and improve and obtain good results.

Reflection or correction did take place but only on the answers that were wrong. Learners used mathematical language incorrectly and, at times, teachers did not correct them. A few open–ended questions asked the learners to explain the mathematical concepts or operation and a brief discussion would take place on how learners would get to the answers. In some instances, closed–ended question were asked to prevent discussion but to make sure learners understand the concept. Learners were mostly encouraging to use lower and middle order thinking skills and were not prompted to think differently or use a learner centred method. The teachers encouraged the learners to use mathematical language when the learner responds to the question asked. Teachers motivated and inspired the learners to achieve and discover answers on set mathematical operation.

Throughout the lesson some, if not all, of the same learners have an interaction with their teacher regarding the lesson and at times teachers asked the learners to justify their reasoning.

The classroom learning resources were appropriate and relate to the concepts that were taught at the time. All classes had Learning and Teaching Support Material (LTSM) material. In all classes the charts on the walls were learner friendly the charts were subject related and concepts for the particular term. There were stations or corners with resources for Languages and Life skills but not much for Mathematics. There was a variety of resource material but none of these were

differentiated for learners with different learning styles or learning needs. In all the classes the learners and teachers used the Department of Basic Education (DBE) Mathematics workbooks to enhance the teaching and learning. Learners would work in their writing workbooks to complete appropriate activities.

In some of the classes, the definitions of mathematical formulas were not written in learner's Mathematics books. Some activities were marked as correct but the operation and answers were incorrect. In conclusion the Grade 3 educators from both schools work hard and produce effective work.

The five content learning areas in Mathematics and the assessment standards, which are the objectives in Grade 3, are being taught. The educators execute the CAPS curriculum in a positive manner although they face many academic and social challenges in the classes. The teachers provided knowledge, skills, and values to the Grade 3 learners.

Tables 4.5 and 4.6 provide a summary of the outcomes of the Annual Systemic Assessment Results for 2022 for School number 1 and School number 2, respectively.

Component	**Concepts**	**Assessment standards applied**	**Question types**	**Difficulty Levels**	**Cognitive levels**
Number Operations and Relationships	Addition Thirty percent learners had the sums incorrect	Solve problems involving addition and subtraction with answers up to 999	Construct response	More complex	Routine procedures
Number Operations and Relationships	Addition, Subtraction, Multiplication and Division 26.8% learners had the sums incorrect	The learners use appropriate symbols: Symbols take the forms of words, gesture, ideas, or visual images and are used to convey other ideas or belief.	Construct response	More complex	Routine procedures

Component	Concepts	Assessment standards applied	Question types	Difficulty Levels	Cognitive levels
Number Operations and Relationships	Counts forwards and backwards. 21.2% learners had the sums incorrect	Count in 20's, 25's, 50's, and 100's to at least 1000. Count in 2's from any multiple of 2 between 0 and 1000.	Construct response:	More complex	Routine procedures Knowledge: Learners need to understand the procedure
Number Operations and Relationships	Sharing leading to fraction 75.9% learners had the sums incorrect	Solve and explain solutions to practical problems that involved equal sharing leading to solutions that include unitary and non-unitary fractions e.g., ¼, ¾ etc.	Construct response:	Easy	
Number Operations and Relationships	Word sum multiplication 60.% learners had the sums incorrect	Solve number problems in context involving multiplication with answer up to 100.	Construct response:	Difficult	Problem solving
Number, Operations and Relationships	Word sum (Subtraction) 46.3% learners had the sums incorrect	Solve number problems in context involving addition subtraction with answer up to 999.		More complex	Multistep, complex

Table 4.5*: Summary: Annual System Assessment results 2022 School number 1*

(Source: Author's own compilation)

Component	Concepts	Assessment standards applied	Question types	Difficulty Levels	Cognitive levels
Number Operations and Relationships	Addition 36.5% learners had the sums incorrect	Solve problems involving addition and subtraction with answers up to 999.	Construct response:	More complex	Routine procedures
Number Operations and Relationships	Addition, Subtraction, Multiplication and Division	The learners use appropriate symbols: Symbols take the form of words,	Construct response:	More complex	Routine procedures

Component	Concepts	Assessment standards applied	Question types	Difficulty Levels	Cognitive levels
	29% learners had the sums incorrect	gesture, ideas, or visual images and are used to convey other ideas or belief.			
Number Operations and Relationships	Counts forwards and backwards. 29% learners had the sums incorrect	Count in 20's, 25's, 50's, and 100's to at least 1000. Count in 2's from any multiple of 2 between 0 and 1000.	Construct response:	More complex Easy	Routine procedures Knowledge: Learners need to understand the procedure
Number Operations and Relationships		Solve and explain solutions to practical problems that involved equal sharing leading to solutions that include unitary and non-unitary fractions e.g., ½. ¼, ¾ etc.	Construct response:		
Number, Operations and Relationships	Word sum multiplication 72.7% learners had the sums incorrect	Solve number problems in context involving multiplication with answer up to 100.	Construct response:	Difficult	Problem solving
Number, Operations and Relationships	Word sum (Subtraction) 36.4% learners had the sums incorrect	Solve number problems in context involving addition subtraction with answer up to 999.		More complex	Multistep complex

Table 4.6: ***Summary: Annual Systemic Assessment results 2022 School number 2***

(Source: Author's own compilation)

Level of difficulty	Blooms Taxonomy	Descriptors (These are not limited to the ones listed below)
Easy	Remembering and understanding	Complete, list name identifies recall repeat state, classify group, draw arrange collect etc.
Moderate	Application and analysis	Predict, understand, rewrite in a certain order, apply, solve etc.
Difficult	evaluation and creating	provide, reason, combine, construct evaluate,

Level of difficulty	Blooms Taxonomy	Descriptors (These are not limited to the ones listed below)
		provide a reason etc.

Table 4.7: ***Levels of questions***

(Source: Author's own compilation)

Level 1	Level 2	Level 3	Level 4
Knowledge (k) Remembering Knowing Straight recall Know and use formula. Read information. Use mathematical facts. Write in sequence. Appropriate use of mathematical vocabulary	Routine Procedure(R) Applying routine procedures in familiar context understanding Perform well- known procedures. Simple application and calculations using basic operation. Calculation which might involve many steps. Estimation and appropriate rounding off of numbers.	Complex Procedures (C) Applying multi steps procedures in a variety of contexts (Including word sums) Problem involving complex calculation and higher order reasoning. Learners decide on the most appropriate procedure to solve the problem. Investigation Conceptual understanding Higher order reasoning	Problem solving (P) Reasoning and Reflecting Unseen routine problems. Higher order understanding. Might require breaking the problem down. Make prediction base on the patterns. The sum of three Consecutive whole numbers.

Table 4.8*: Cognitive level*

(Source: Author's own compilation)

4.15 Grade 3 Systemic Assessments for Mathematics

In Mathematics tasks, learners were assessed on their knowledge of facts and operations, the use of concepts, the solving of routing problems, and reasoning. Assessment of understanding number operations includes assessing the learner's proficiency in basic calculations and simple operations that involve addition, subtraction, multiplications and division. The following sample provides examples of questions that can be expected in the Grade 3 Systemic Assessment for each content area.

The Systemic Assessments cover FOUR content areas. Sample items (see example that follows)

provide examples of questions that can be expected in each of the content areas. Items that are included in this set cover only Numbers, Operations and Relationships.

Pages 2 of 6 ALL QUESTIONS ARE 1 MARK EACH

1. Write the next number in the pattern. 68 78 88 _____
2. Count backwards in 100s and fill in the next number on the line. 570 470 370 _____
3. Thandi has R149. James has R156. Emily has R143.
   Who has the most money? _____
4. 11 + 11 + 11 + 11 = _____
5. 82 + 18 = _____
6. How many children are there in this school altogether?
   Grade 1: 38 children, Grade 2: 46 children, Grade 3: 32 children
   _____ children.
7. A shop has 174 litres of cool drink. The shop sells 46 litres.
   How many litres are left? _____ litres
8. 6 x 10 = _____
9. 8 x 8 = _____
10. 4 friends share 9 bars of chocolate equally.
    How many bars does each friend get? _____
11. 50 x _____ = 100 x 2
12. Nomsa bakes a cake. Her three children each take a quarter of the cake to school. How much of the cake is left? _____ of the cake is left.
13. How many millilitres of milk are there in this full 2 litre bottle of milk?
    There are_____ millilitres of milk in the 2-litre bottle.
14. Write the next number in the pattern. 45 50 55 _____
15. Count backwards in 10's and fill in the next number on the line. 190 180 170 _____
16. Arrange these numbers from the smallest to the biggest on the lines below.
    81 28 48 18 84 _____ _____ _____ _____ _____
17. 34 + 45 = _____
18. 55 – 17 = _____
19. 4 x 6 = _____
20. 7 x 7 = _____
21. A shop has 144 bread rolls. The shop sells 85 rolls
    How many rolls are left? _____ rolls
22. Judy the Pirate Queen has 8 boxes of jewels. She has three jewels in each box.
    How many jewels does Judy the Pirate Queen have altogether?
    Judy has _____ jewels.
23. Mom took a quarter of Thumi's birthday cake for Granny. What fraction of the whole cake is left? _____ of Thumi's birthday cake is left.

Competencies assessed:

- Understanding operation and doing basic calculation to solve problems.
- Developing patterns and relationship.
- Identifying shapes and space (geometry).
- Using appropriate measuring units and formulae.
- Handling data presented in different ways.

Only question papers of the Metropole South District were selected as part of the purposive sample. No specific reference was made in terms of complete or incomplete question papers. It was expected of the Grade 3 learners to write and complete a Systemic Assessment Mathematics in 1 hour, 30 minutes on the same day. As shown above, the distribution of marks for paper 1 and paper 2, according to Bloom's taxonomy levels, (depicted in Figure 4.1) consist of mostly closed questions where only a limited number of responses can be given.

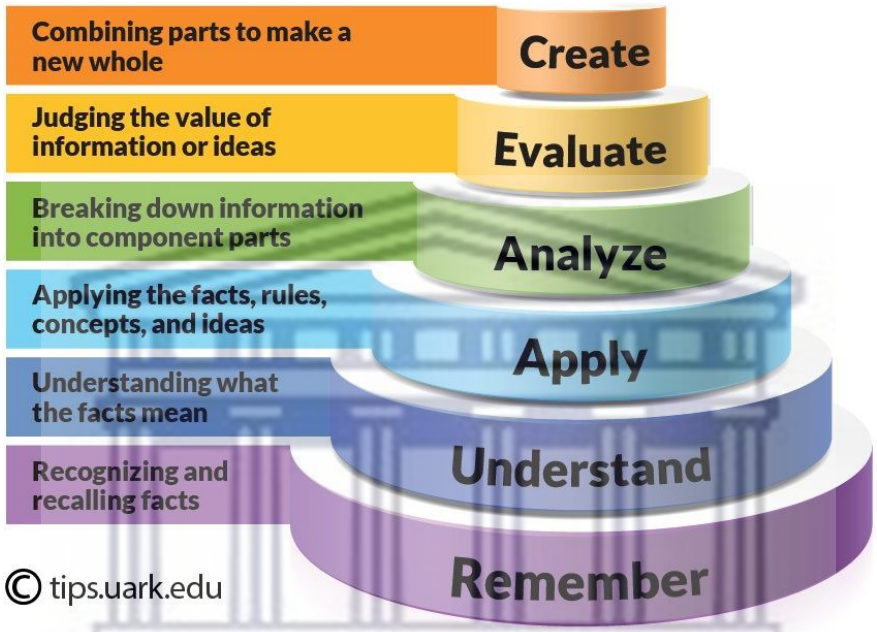

Figure 4.1: ***Bloom's Taxonomy Levels***

(Source: wordpressua.uark.edu/wp-content/uploads/sites/315/)

According to the Subject Assessment Guidelines for Mathematics **(**SAGM**)** taxonomy, it is assumed that the cognitive level increases with the type of mathematical activities. Memorisation has the lowest cognitive level, then routine procedures then complex procedures then problem solving. Constructed response can be used to enhance and complement the work the learners do in a performance task.

According to the 2022 Systemic Assessment diagnostic results, a larger number of complex rather than difficult questions were asked on the component Number, Operations and Relationships. The multiple-choice questions provide little information about the learner's understanding of the concept being assessed, as these questions allow learners to guess the answers. The multiple-choice questions are designed to assist teachers to diagnose learner's misconceptions in Mathematics. The Systemic Assessment Mathematics questions are phase-based, which means it includes questions that assess the performance of Grade 3 learners in work covered in grades 1, 2, and 3. Table 4.9 presents the

performance results for each grade level.

School 1	Grade 1	Grade 2	Grade 3
School	74.1	88,0	61.1
Province	82.1	78.2	47.3
School 2	**Grade 1**	**Grade 2**	**Grade 3**
School	70.	85.5	57.3
Province	82.1	78.2	47.3

Table 4.9*: Pass percentage across grades*

(Source: Author's own compilation)

Table 4.10 presents the results obtained by Grade 3 learners in both participating schools, for the year 2022.

School Year 2022	0% - 19%	20% - 29%	30% - 39%	40% - 49%	50% - 59%	60% - 69%	70% - 79%	80% - 100%
School 1	5.6	9.3	6.5	17.6	11.1	20.4	14.8	14.8
119 learners	7	10	8	21	13	24	18	18
School 2	6.4	7.3	12.7	16.4	6.4	15.5	11.8	23.6
126 learners	8	9	16	21	8	19	15	30

Table 4.10*: Scores attained by Grade 3 Learners in School 1 and School 2 for the year 2022*

(Source: Author's own compilation)

Performance categories

Table 4.11 demonstrates the assessment results for Grade 3 in the Western Cape for the period 2019-2022, into performance categories.

Year	*Mathematics*		*Language*	
	Pass	*Ave %*	*Pass %*	*Ave %*
2019	*58.1*	*54.5*	*44.9*	*44.2*
2021	*44.3*	*46.7*	*36.9*	*38.9*
2022	*47.3*	*49.8*	*38.5*	*40.5*
Difference 2021-2022	*3.0*	*3.1*	*1.6*	*1.6*

Table 4.11*: Grade 3 2019 - 2022 Systemic Assessment results in Western Cape*

(Source: Western Cape Government News and Speeches March 2023)

The Foundation Phase is 100% School-Based Assessment (SBA) which means that the learners write their task in class with support of the teachers. The Systemic Assessment for Grade 3 is a mode of an exam that the learners are not acquitted with. A functional SBA system is in place to support effective curriculum implementation.

From the 119 learners at school 1, 39% (46 learners) performed below average and 61% (73 learners) above average. Of the 119, 24.4% learners scored the highest in code 5 in bracket (60-69%) % which indicates the level of understanding, knowledge, and skills in Mathematics.

From the 126 learners at school 2, 48% (62 learners) performed below average 52%, 64 learners performed above average. From the 126, 23.6 % learner scored the highest in code 7 in bracket (80-100%) which indicates the level of understanding, knowledge, and skills in Mathematics.

More routine cognitive level questions were set which indicate that learners had an opportunity to apply their knowledge through procedural steps, steps of how to get to the answers. Mark allocations for the 28 questions in Numeracy, Operation and Relationships were incredibly low it was 1 mark per question. Therefore, the learners had a fair opportunity to score more marks in Number, Operations and Relationships focus area. Learners must be able to read well and have a good mathematical cognitive development in order to understand and answer the questions as 10 of the 28 questions were word sum questions. The word sums and sharing leading to fractions were the skill concepts where learners had the most sums incorrect. Reflecting on the grade across Systemic Assessment results of 2022 it indicates that more learners understand grade 1 and 2 concepts in Mathematics.

The outcome of both sample schools' Systemic Assessment results range more or less at the same level of understanding and there is a pattern. A possible explanation for what the data shows in tables 4.10 and 4.11 is that the Systemic Assessment results in certain mathematical areas at both schools indicate a direct relationship between the research on how teachers teach and what learners learn in Mathematics. Table 4.12 lists the results obtained in both schools according to their curriculum areas.

Content areas assessment	School	Pass %			Ave%		
		2019	2021	2022	2019	2021	2022
Numbers, Operation and Relationship Weighting/ 58%	School 1	70,1	59,5	60.2	61.2	67.2	54.1
	School 2	66.7	48.2	54.5	58.0	49.4	53.7
Patterns Functions and Algebra Weighting/ 10%	School 1	88,1	64.7	89.8	63.2	63.2	86.6
	School 2	92.2	45.6	84.5	74.5	48.2	80.0
Space and Shape (Geometry) Weighting/ 13%	School 1	88.1	92.2	72.2	83.4	83.4	64.2
	School 2	79.2	80.7	80.9	70.7	68.1	68.2
Measurement Weighting/ 14%	School 1	33,6	33.6	48.1	32.2	32.2	48.5
	School 2	79.4	17.5	52.7	33.7	20.6	52.4
Data Handling Weighting/ 5%	School 1	83.6	69.8	86.1	58.2	58.2	60.2
	School 2	74.5	51.8	90.0	65.2	43.4	62.7

Table 4.12*: The results of the two schools according to the curriculum areas from 2019-2022: Pass and average percentage within content areas.*

(Source: Western Cape Education Department Systemic test 2019-2022)

4.16 Results analysis

The outcome of the results was rather complex. The diagnostic analysis of the research uncovered the potential cause of the finding. Learning experiences can assist learners to build fundamental understandings of mathematical ideas that will enable them to acquire important mathematical skills.

The Systemic Assessment can facilitate the Western Cape Education Department to identify specific areas that require improvement in Mathematics for Grade 3 learners. The result of the assessment assists schools to improve their class Mathematics outcomes but do not contribute to improvement in the individual learner's results. The System Assessments is a useful tool for schools and educators as they provide specific information on various learning areas.

The Systemic Assessment is a form of self-evaluation on how teachers reflect on classroom practices during and after the Mathematic lesson. Through this process, learners and teachers were made aware of everyday mistakes. The process might improve the learner's mathematical skills and teacher's knowledge of the subject. Teachers show the learners common mathematical errors they have made and assist them to rectify it.

The Systemic Assessment does not give an indication of each learner's weak areas but helps to identify gaps within the weak areas in the entire grade and phase. It gives an idea of the areas of need per class but does not always aid each individual learner, especially if the learner requires intensive support with learning barriers and challenges or special needs (e.g., Attention-deficit hyperactivity disorder (ADHD), anxiety, etc.).

The Vygotsky theory contends that we are born with four elementary mental functions: attention, sensation, perception, and memory, and that using these elementary skills in our social and cultural environments aids our development and allows us to finally gain higher mental functions. Vygotsky examined the social and cultural differences between individual learners to help understand how each child learns and develops. He believed that the socio-economic status and culture of a learner had a great impact on said child's cognitive skills. Both researched schools were quintile 5, which means the schools were in a good socio-economic bracket according to the Department of Education.

However, the Western Cape Department did not keep track with the socio-economic condition of the area. A few informal settlements were erected in the surrounding areas and the schools enrolled most of the children. Most of these learners from the disadvantage areas had socio –economic barriers which had a huge impact on their learning. Furthermore, learners have different learning styles which the assessment did not take into consideration. The needs of learners were constantly changing due to limited resources and varied learning methods.

Teaching methodology, knowledge and understanding Mathematics in Grade 3 has an impact on the System Assessment results. There is a trend at both schools where most learners had the answers incorrect in the following component assessment areas like sharing leading to fractions, word sum multiplication and word sum subtraction. The interpretation of the results might have a strong correlation between the hypothesis and the outcome of the Systemic Assessment.

The data discloses information about the participants both teachers and learners understanding and application in Mathematics in Grade 3. According to the Western Cape Education Department the systemic assessment results of 2022 show that the recovery interventions had an impact in the Foundation Phase. The Grade 3 Mathematics pass rate and average scores of 2022 increased significantly compared to the year 2021. Reason teachers identify areas needing remedial and support.

The weighting in Grade 3 for Numbers, Operations and Relationships is 58% hence more time is dedicated for teaching and learning in these particular concepts. Numbers, Operations and Relationships are the main focus of Mathematics stipulated in the CAPS document. Learners need to exit the Foundation Phase with a secure number sense and operational fluency. The aim is for learners to be competent and confident with numbers and calculations. The weighting of Mathematics content areas serves two primary purposes: firstly, the weighting gives guidance on the amount of time needed to address the content within each content area adequately; secondly the weighting gives guidance on the spread of content in assessment. The weighting of the content areas is not the same for each grade in the Foundation Phase. The Systemic Assessment results of both schools indicate that the learners underperformed in Numbers, Operation and Relationship compared to the other concepts of Mathematics that has lest teaching and learning time.

Assessment is not only a way we can measure learner's performance, but it is also a way for teachers to plan instruction and reflect on their own methods of teaching. The Foundation Phase is 100% School-Based Assessment (SBA) which means that the learners write their task in class with support of the teachers. The Systemic Assessment for Grade 3 is a mode of an exam that the learners are not acquitted with. A functional SBA system must be in place to support effective curriculum implementation.

While the Systemic Assessment results are often useful to provide information about patterns of learners' achievement, it does so without providing the opportunity for learners to reflect on areas for improvement and does not provide an avenue for the teachers to modify teaching strategy during the teaching and learning process. (Maki, 2002). To motivate learners, teaching processes must not only impart knowledge and abilities but should also attribute value to learners and strive to help them to achieve. Learning enables learners not only to increase what they know but also to realise what they can do with what they know.

4.17 Limitation

Resources for learners and teachers were limited despite the schools being classified as quintile 5 schools. However, the teachers were innovative and personally created an individual small, white board for each learner to do their basics operations on. Limited resources for learners and teachers in Mathematics impacted on the Systemic Assessment results.

4.18 Conclusion

Chapter four outlined the research methodology used in the study. This chapter research methodology, research setting and research design which are Mixed Method. This chapter also looked at all things related to how the data was collected. Therefore, this chapter outlined the data collection methods tools, sample and how data was analysed.

Overall, the findings, qualitative results, quantitative results, and discussion of the study, provide important insight into the relationship between the Grade 3 Systemic Assessment results and learners approach in Mathematics.

Based on the quantitative and qualitative analysis of the Systemic Assessment results in Mathematics it can be concluded that teaching and learning approaches are important factors affect learners results in the Systemic Assessment. Further studies are needed to determine the causes of effects of relationship between results and approaches.

CHAPTER FIVE: DATA ANALYSIS

5.1 Introduction

The process of data analysis uses analytical and logical reasoning to gain information from the data collected. The main purpose of data analysis is to find meaning in data so that the derived knowledge can be used to make informed decisions. The motive behind data analysis in research is to present accurate and reliable data. After the data is prepared for analysis, the researcher uses various research and data analysis methods to derive meaningful insights from the study. For the purposes of this study, Content Analysis will be used to analyse documented information from the systemic assessment results. In addition, Narrative Analysis will be used to analyse content gathered from a variety of sources such as personal interviews, field observation, and surveys, to find answers to the research questions. Furthermore, the researcher realised that if the data were not analysed immediately, they easily became distorted because the context for some issues that were raised had been forgotten. Therefore, there is a likelihood of incorrect interpretation (McMillan & Schumacher, 2006).

5.2 Research approach

The mixed-method research design is a procedure for collecting and analysing, which mixes both quantitative and qualitative research and methods in a single study to gain understand of a research problem. In terms of this study, the quantitative analysis will show the results and performance in particular topics in Mathematics in Grade 3 during class observation questionnaires and semi-constructive interviews. This will be done in the form of percentages and scores. The topics will be further refined to specific mathematical concepts or learning outcomes related to the CAPS curriculum. These data scores will then be analysed qualitatively, connecting the performance to the ways of doing Mathematics, which will be visible in the learners' responses. To respond to the research questions, the teaching and learning of Mathematics in the Grade 3 classroom in the selected schools will be examined. Therefore, the researcher will make use of classroom observation and questionnaires, which will be given to the educators teaching Grade 3 learners as well as subject advisers working in this suburb.

The researcher visited four Grade 3 classes at the selected schools to observe a Mathematics lesson once a week for four weeks. Most of the classes were under resourced. All observation notes and remarks were compiled and organised by the researcher. The participating Grade 3 educators were

given a questionnaire which they could complete in their own time within a timeframe of two weeks. The two-week period was allocated to allow the educator's time to reflect on their teaching method and the learning process of the learners. Each of the four grade 3 educators from the two sample schools was interviewed individually. Each session took approximately 20-30 minutes. The educators had to write down their own answers as best as they could understand the questions asked by the researcher. Follow up interviews were conducted where answers had not been clearly understood or interpreted.

5.3 Purpose of the Annual Systemic Assessment

The purpose of the Annual Systemic Assessment is to measure the level of the learners and determine whether the school is an underperforming school or a performing school. The assessment also allows the teachers to know which areas they must revise, consolidate and start improving the grade and phase performance. Another purpose of the Systemic Assessment is to evaluate the learners on mathematical concepts taught from Grade 1 to 3 and from Grade 4 to 6.

The Systemic Assessment takes place annually place to ascertain if the curriculum has been covered and to assess the system or curriculum. Systemic Assessment helps to gauge the depth of Grade 3 learners' knowledge in terms of Literacy and Numeracy, in the Western Cape. The assessment is used as a measuring instrument to help identify where the gaps exist and to find ways to bridge these gaps. Furthermore, the assessment measures the standard in Mathematics to determine the compatibility of the education system the CAPS curriculum. The systemic assessment gives educators an understanding of the strengths and weaknesses of learners at a particular school in a particular grade and helps educators to set new goals and zoom in on areas of need indicated the following year.

In summary, the Systemic Assessment exists to assess the education system, benchmark the performance, and track how learners perform in Mathematics and English in schools. Since the low performance in Mathematics and literacy are the major concerns, the Western Cape Education Department has introduced the systemic assessment to improve the performance of the learner. The results of the school-based assessments differ from the results obtained in the systemic assessment, with the School-Based Assessment results being higher that the Systemic Assessment results. The School-Based Assessment methods take the form of continuous assessment of academic ability, whilst the systemic assessment is a single assessment conducted per year. The quality of questions in

the latter are aimed at a high level.

Assessments at schools are controlled and marked by the Grade 3 educators. The Systemic Assessment creates added pressure for the Grade 3 learners and teachers. The questions in the school-based assessment papers are differently set as the question in the systemic assessment. The Systemic Assessment times are allocated, and learners have to complete their task in allocated time. The Grade 3 learners are not accustomed have having strangers administer their assessments; hence the learners feel uncomfortable and do not ask for explanations or clarification on questions they do not understand. Learners are pressured to perform because educators have inculcated the mentality that learning is all about performance.

The Systemic Assessment is conducted early in the fourth term of the year, towards the end of a particular phase. The Grade 3 and Grade 6 (end of Foundation and Intermediate Phase) learners are assessed by the education system in the Western Cape. The assessment helps to identify areas that require improvement and assist the schools to improve their outcomes. However, other assessments are done quarterly to assess the learner's understanding of the content taught based on the stipulated guidelines and milestones indicated in the CAPS.

Educators do an item analysis on mathematical concepts to determine areas of underperformance and to correct, consolidate and strengthen the understanding of the concepts. The analysis also serves as a form of self-evaluation and reflection on how educators teach, and learners learn.

Educators group the learners in ability groups to practice the questions repetitively and introduce methods on how to complete particular concept. They demonstrate to learners how to rectify common mistakes they have made and guide learners through the process. Teachers allow learners the opportunity to demonstrate different mathematical methods and strategies on the board. Teachers present each group with a problem and get them to do the sum or problem on newsprint and then come and explain to the rest of the class in their allocated groups. The reason for these demonstrations is to enhance learners understanding of the concepts they struggled with and allow them multiple opportunities in Mathematics. During group work, learners are given the time to reflect on what they have learnt.

The educator makes use of the intervention programme and questions the learners on the work that has been covered. Opportunities are given to learners on a weekly basis in informal assessments, in

addition to the formal assessment at the end of the quarter. Differentiated oral and written questions are introduced to the learners. Educators gradually increase the number range and incrementally make the problems more challenging for the learners. Educators make use of facial expressions, affirmation, gestures, higher and lower questioning styles to assist learners using the scaffolding method. The scaffolding method is the process of breaking lessons into manageable units, with the educator providing support as learners grasp new concepts and master new skills.

The learners familiarise themselves with the mathematical methods taught in class. Educators attend training and workshops offered on mental strategies to remain up to date and acquire additional skills to assist learners using a variety of mathematical strategies in class. The training sessions also train educators to improve their teaching of the measurement concepts (e.g., capacity, time, etc.,) and to mentor novice teachers in the Foundation Phase.

The Grade 3 educators analyse the Systemic Assessment results and have an in-depth discussion on staff and grade level on areas that needs improvement. Educators discuss and highlight lowest percentage scores of the mathematical concept. After the grade discussion, educators unpack questions relating to mathematical topics. Numbers Operation, Patterns, Measurement, Time, and Data Handling. Areas that need improvement are selected and teachers design suitable intervention plans to address these areas. The Foundation Phase Head of Department monitors intervention for curriculum coverage.

5.4 Challenges and gaps

The results of the systemic assessment do not indicate individual learner's weak areas, but they do facilitate and identify mathematical gaps in the grades and in the phase. Learners with learning disabilities and learning barriers write the same Systemic Assessment which is not fair towards these learners.

The Systemic Assessment is an additional workload and demands extra preparation from both teachers and learners. Nevertheless, it helps teachers to ensure that the curriculum is covered and assists them to teach the requirements in the curriculum. It creates an immense amount of stress and teachers suffer burnout trying to push and teach as much content during the Grade 3 year, and even try to teach grade 4 work. Learners are drained and tired because of the vast number of concepts and

content they need to know by the third term. Learners are expected to do more in the grades where they write systemic assessments (e.g., Grade 3 and Grade 6 and 9).

The Systemic Assessment includes a certain percentage of curriculum coverage from the intersen, grade 4. Learners feel pressured, overwhelmed and stressed, and do not complete all the answers asked in the Systemic Assessment. The Grade 3 educators think that the Systemic Assessment results are not a true reflection of a learner's performance. An average of 8-10 learners per class has learning barriers and special needs, and therefore is at risk. Some learners are on medication like Ritalin and may even require a scribe to complete the assessment. Others may need placements at special schools but are not exempted from wring the assessment and their scores lower the marks of the class and the phase.

Learners are grouped according to their abilities for their entire Foundation Phase years but are all expected to write the same level assessment in the Systemic Assessment. Some learners have severe reading challenges and do not receive any assistance with the reading of instructions. Hence, they are unable to complete the assessment. Many learners are not ready for the grade and have progressed with support. These learners are expected to write the same assessment. Some learners suffer from anxiety and do not do well under pressure or in formal settings. Having strangers administer the assessment also creates fear and stress for the learners which might cause learners to make unnecessary errors. If learners are unable to read fluently, the prescribed time will not be sufficient to complete the assessment.

Some teachers were not sure if they had covered all the work as per CAPS requirements. There are many factors at play when looking at the systemic results. The way questions are posed in the systemic assessment could differ from what learners are accustomed to in the School-Based Assessment. Parents who do not assist learners with homework or who are not involved in their children's schooling can also impact assessment results.

Not much assistance is given to ensure intervention strategies. Intervention activities must be drawn up effectively to consolidate and intervene before learners move on to new work. Learners struggle to read the questions. Personal teaching styles and methods must therefore be improved.

The Systemic Assessment results give a clear indication of the gaps. Time constrains, oversized classrooms, and learners with learning barriers contribute to making the assessments a cumbersome

task. The demands are great and putting intervention in place is exceedingly difficult. The assessment provides an overview but does not allow teachers to support the individual learners who actually wrote the assessment the previous year. Those learners proceed to the next grade. We also receive an overview of the headings (concepts) learners struggle with (e.g., the passing of time) but do not receive any examples of the actual questions, regarding how these are phrased.

Educator A at school 2 stated:

> Teaching the skill of problem solving is an extremely daunting and tiring process involving significant extra marking, admin, and additional work. At times I feel extremely overwhelmed, not with the teaching but the actual assessment and marking. Learners are constantly under scrutiny and inspection, as well as Grade 3 teachers. Learners' assessment results and analyses must be done all the time, making my job unpleasant at times. The amount of assessment is creating poor relationships with parents as they constantly have to do homework and study and prepared them for the assessment, it is tiring and normally the Grade 3 teachers are overworked and never really hugely appreciated unless the results are good.

The way teachers cope is to workshop strategies with parents, to teach them how best they can assist their children with homework and be on the same page. One teacher explained that she starts stories and questions from the start of the year, in an attempt to familiarise her learners with systemic assessment type questions.

Teachers try to focus on the areas in which the learner underperformed in the previous year. The researcher also found that some learners do not know concepts taught in Grade 1 and 2, setting the teacher back immensely, in terms of time. The teachers reported feeling that Grade 3 educators are expected to teach the bulk of the curriculum, including content from Grade teach Grade 1 and Grade 2, over and above Grade 3 work, to get learners ready for systemic assessment covering work up to Grade 4.

Educators become overwhelmed. The assessment compels learners to focus more but they feel pressured and often fail to complete the test. Findings indicate that teachers think that the Systemic Assessment implementation has not been effective a vast majority of the time, due to factors such as Covid in 2020 and other conditions which could influence learner's performance but are outside of the teacher's control. Systemic Assessment gives an idea but is not always a true reflection of how

well the teachers teach and how strong the learners are. The outcome also depends on the type or quality of learners the teachers have to teach each year. Naturally, some classes are stronger that others due to the fact their foundation has been laid well by more experienced teachers or really good teachers. Some learner's school years are interrupted by class teachers leaving the school for various reasons, and/or learners being transferred to other schools. The learner who experiences disruption in the school year, does not perform as well as the learner or class whose learning experience has been stable.

5.5 Recommendation

Challenged learners should be assessed on another level. However, they are not catered for. The assessment is an effective way to ascertain how teachers are performing as a school, but it is very taxing since the Curriculum already imposes time constrains to cover the work and the curriculum is overloaded with content.

Some teachers think that the plan concerning the System Assessment is unreasonable and that the Western Cape Education Department should consult with the actual grade teachers when setting up a systemic plan and question papers. Grade 3 teachers must be involved in setting up systemic assessment question papers as they are the most experienced and knowledgeable about the content. Some teachers feel that the systemic assessment is very clinical and should not be marked by people outside of the teaching profession or by any external entity. Instead, the marking should be done by Grade 3 teachers or retired Grade 3 or Foundation Phase teachers.

Many learners have reading challenges and time management is a challenge. Having to deal with the learners who have learning difficulties, learners awaiting placement, learners with severe anxiety disorders, learners with ADHD unable to focus for even short periods of time, places additional demands on teachers. Learners with learning disabilities are unable to learn as they should. Furthermore, the learners from the informal settlement were not receiving assistance from home and were experiencing learning barriers because of a lack of resources and other social challenges. It is hugely challenging to prepare learners in Grade 1, 2, and 3 levels in the same class for the same systemic paper when the class includes learners with reading barriers and poor comprehension skills. Other challenges that arise include poor parental support, content overload and too much assessment and admin for the teacher.

The question level of the Mathematics is a challenge, and the content is not relevant to the learner. The higher order questions are challenge. Context is sometimes not known to learners.

Extra assistance would be helpful. Each Grade 3 needs highly skilled, trained and competent assistant tutors to assist challenged learners with one-on-one help. Teachers should be given past systemic assessment papers to work through so that they can see the questioning techniques and styles. The teacher has no idea of the structure and the set of the actual systemic assessment. Some sort of assessment should be conducted each year not only Grade 3 to get all teachers to prepared learners well during the year not only in Grade 3. It is suggested that the assessment be done over a longer period of time and not in two intense assessments on one day. In addition, the actual Grade 3 and Grade 6 Systemic Assessments should be dropped and replaced by a yearly assessment for each grade, like the ANA assessment. This will also encourage teachers to improve their teaching styles and improve and obtain good results.

5.6 Validity

The concept of validity in research was formulated by Kelly (1927 p. 14), who stated that an assessment is valid if it measures what it claims to measure**.** Validity is defined as the extent to which a concept is accurately measured in a quantitative study. Data validation is performed to determine whether a collected data sample adheres to the pre-set standards or is biased. Data sample validity is categorised into four distinct stages.

Fraud:	To ensure an actual human being has recorded each response to the survey or the questionnaire.
Screening:	To make sure each participant or respondent has been selected or chosen in compliance with the research criteria.
Procedure:	To ensure ethical standards were maintained while collecting the data sample. The sample group must be representative of the target population to ensure external validity.
Criterion validity:	The extent to which a research instrument is related to other instruments that measure the same variables.
Completeness:	To ensure that the respondent has answered all the questions in an online survey. To ensure that the interviewer asked all the questions devised in the questionnaire.

Reliability relates to the consistency of a measure. A participant completing an instrument meant to measure motivation should have the same responses each time the assessment is completed. Although it is not possible to give an exact calculation of reliability, an estimate of reliability can be achieved through a variety of measures.

5.7 Ethical Consideration

Permission to undertake the study was requested and obtained from the Western Cape Education Department (WCED). Additional application for clearance was submitted to the Ethics Committee for any changes that will be implemented. A letter requesting permission to conduct the study was sent to each of the two schools, along with a consent letter to the parents of learners in the classes that were observed. These letters explained the research, and provided the researchers contact details to the participants and parents. The benefits and/or risks of participation were stated in the letter. Any Grade 3 learner could withdraw or refuse to participate in the study at any time. The letters ensured confidentiality and anonymity.

The cornerstone of ethical research is' informed consent' (Denzin & Lincoln, 2011). The term consists of two essential elements, with each requiring careful consideration; these two elements are *informed* and *consent*. The participants were fully informed of what will be asked of them, how the data would be used, and what (if any) consequences there could be. The participants provided explicit, active, signed consent forms to take part with the research, including confirmation that they understood their rights to access to their own information and the right to withdraw at any point. The informed consent process was seen as the contract between researcher and the participants.

The terms *participant anonymity* and *participant confidentiality* are commonly used synonymously. However, these terms describe two distinct concepts. Participant anonymity means the participant's identity is unknown to the researcher (e.g., when using anonymous surveys, the participant's identity is truly unknown to the researchers). Participant confidentiality means the participant's identity is known to the researcher but the data was de-identified and the identity of the participant is kept confidential (e.g., interviews where the participant's identities are known to the researcher). In the latter instance, the researcher can only offer confidentiality, as anonymity is not an option.

In the case where learners did not agree to participate however, the researcher would establish the

reason why learners did not want to participate in the research. Any fears that might present would be allayed by making learners feel at ease and assuring them that it is okay to make mistakes. As the researcher in the study, I undertook to make certain that the classroom was a safe space for trying, failing, and trying again. In addition, I created an atmosphere that encouraged participation, not just in the sense of answering questions but also to facilitate seeking help or asking for clarification. If a learner still chose not to participate, I would thank them but assure them that should he or she wish to change their mind, the learner would be welcome to be part of the programme or research while it remained open.

A discussion took place with all the Grade 3 educators from the two sample schools involved in the research. The discussion prioritised an agreed strategy to ensure a support, or recovery, plan for learners who clearly did not want to take part in the research. The strategy would ensure that learners remained on track with their grades. However, in the case where learners were clearly not participating in the research activities, those learners would be relocated to the Grade 3 educator at the school that was not part of the research process. The support or recovery plan that was agreed upon would be implemented to ensure that learners avoid falling behind with their work.

5.8 Data storage

These days most data are collected and stored digitally. This allows for security preventing anyone from obtaining physical records held in a research facility, but it also means that anyone wishing to illegally break into those files to access sensitive information can do so if they have the knowledge and capability. Digital records add an entirely new layer of security measures that must be employed to ensure the confidentiality and anonymity of the research subjects remain secure.

As a researcher, the minimum measure I should use is a password protected file with secure, high-level passwords that are accessible only to me, and if I should write the passwords down, I must store them in a secure place and ensure that is as inaccessible to others as possible. Hands-on work must be stored in areas that are securely locked, including drawers with locks. I must also apply codes that only I can translate to any identifying information.

The methods described, helped me to retain confidentiality and anonymity and reassure study participants that my study identity was protected. The Protection of Personal Information Act, 2013 (POPIA) protects the personal information of natural and juristic persons and requires the researcher

to comply with the following eight minimum conditions set out in the Act. Personal information was collected on receiving permission from the school principals and the Western Cape Education Department.

The researcher undertook to only collect personal information under the POPIA Act where that information was pertinent to, or related to, the study. The researcher would not provide personal information to anyone else unless consent thereto or exception applied, (i.e., that the information is used for research purposes and is not published in an identifiable form). The researcher ensured that the information collected and stored was accurate, up to date, complete and not misleading (Section 16).When the researcher shared personal information with selected service providers who work on the researchers' behalf, for a specific, defined purpose related to public services, the researcher ensured that appropriate protections of the personal information were in place with the third parties in accordance with the obligations under the POPIA.

The researcher made sure that the participants were informed of their rights to access, correct and delete their personal information and of the manner in which to do so (Section 23-25). The participant was informed as to why the information was collected and where it is being held, what right the participant has to access, delete or correct the data and if the data will be transferred to a third party during the processing. According to Section 11 of the POPIA Act, where consent of a child is required for processing personal information, a competent person must provide consent on their behalf. The person consenting must be legally competent to consent to the action or decision of the child.

When storage of personal information and disposal of information is no longer required, the researcher will delete or destroy said information in a secure manner and manage the process in accordance with the POPIA Act; 2013 The researcher will take reasonable steps to protect the personal information held in her possession against loss, unauthorized access, modification, disclosure, use or misuse. The researcher will ensure that personal information is kept secure to maintain confidentiality and integrity and to prevent data breach.

5.9 Conclusion

The study focused on how learner's approaches to learning Mathematics impact the effectiveness of the Systemic Assessment results. The objectives of this research have been identified and the

findings of the data collected have been discussed. According to the opinions of the respondents, the results of the Grade 3 Systemic Assessment in Mathematics and the findings of this research indicate that teachers should know the subject Mathematics in order to teach the subject.

Mathematical knowledge alone does not translate into better teaching. Cooney (1999, p. 243) asserts that teachers need at least three kinds of knowledge to be effective in choosing worthwhile tasks, namely, analysing their teaching and children's learning: knowledge of Mathematics, knowledge of children and knowledge of pedagogy of Mathematics. The findings have revealed that the manner in which learners are taught in Grade 3 correlates with the way they approach mathematical concepts in the Systemic Assessment.

The Systemic Assessment helps the department to identify specific areas in Mathematics that need improvement and assists the schools to improve outcomes. Hopefully, this research contributes to an understanding that the results of the Systemic Assessment in Mathematics do not always refer to the individual learner's performance but to the system of the Department of Education.

CHAPTER SIX: DISCUSSION, RECOMMENDATION AND CONCLUSION

6.1 Introduction

The purpose of this mixed-grounded theory study was to identify how learners learn, and teachers teach Mathematics in the Foundation Phase. This chapter (Chapter 6), includes a discussion of the major findings of the study, as related to the literature on the impact of the way learners learn and teachers teach in Mathematics in Grade 3. The chapter also presents a discussion on connections to this study, motivation theories, and the curriculum policies of the Department of Education. It describes the limitations of the study, identifies areas for possible future research, and concludes with a brief summary.

The objective of this study was to investigate the discrepancy between the Grade 3 learners' Systemic Assessment Mathematics results and the results obtained in School-Based Assessments by the same grade, to understand why the two sets of results are not consistent. Hence, the study examines how learners learn and how teachers teach the required mathematical skills and concepts.

The Systemic Assessment for the Grade 3 Mathematics is mandated by external authorities for the general purpose of accountability. The ability to teach Mathematics content is influenced by the mathematical content and the pedagogical knowledge of the teachers (Piccolo, 2008)

As stated by Newton (2007), assessments have been used for a variety of purposes, including assigning grades to learners, ensuring national accountability, monitoring systems, allocating resources within districts, determining interventions, enhancing teaching and learning, and giving specific feedback to learners and their parents/guardians. However, comparison of the two forms of assessment for Grade 3 Mathematics, revealed a marked difference in the results obtained. This discrepancy in marks was the motivation behind this study which undertook to answer the following research question.

6.2 Research question

What are Grade 3 learners approaches to working in the Systemic Assessment Mathematics?

6.3 Sub research questions

- In which way do the responses of learners in the Systemic Assessment Mathematics reflect their learning?
- Do learners' approaches to working in the Systemic Assessment Mathematics reflect the way teacher teach Mathematics in the classroom?

6.4 Method

The chosen design for this study was the mixed-method approach; the quantitative method suggested that what the learners had learned in the class resulted in the scores obtained in the Systemic Assessment; the qualitative method signified how the learners learn in the class in order to answers the question in the Systemic Assessment. The latter refers to how teachers teach. The mixed-method approach gave the researcher access to a broader range of information in the study by allowing the researcher to pose both how and what questions. The answers to these questions will contribute to understanding the research problem in a holistic way.

The study embarked on primary data collection to obtain firsthand information. The data collection was by means of classroom observation, semi-structured interviews and questionnaires to provide effective cause or explanation of the problem. The study used thematic analysis which seeks to identify patterns and themes to organise the data accordingly, and to discover useful information to support the research questions.

6.5 Results

A diagnostic analysis of the research uncovered a possible cause for the somewhat complex finding that learning experiences can assist learners to build fundamental understandings of mathematical ideas that will enable them to acquire important mathematical skills.

The Systemic Assessment can facilitate the Western Cape Education Department to identify specific areas that need improvement in Mathematics for Grade 3 learners. The Systemic Assessment is a useful tool for schools and educators as they provide specific information on various learning areas. However, while this assessment assists the schools to improve their class Mathematics outcomes, it does not enhance the individual learner results.

The Systemic Assessment is a form of self-evaluation that allows teachers to reflect on classroom practices during and after the Mathematic lesson. Through this process, learners and teachers are made aware of everyday mistakes. The process might improve the learner's mathematical skills and teacher's knowledge of the subject. Teachers would show the learners common mathematical errors they made and assist them to rectify it.

The Systemic Assessment does not indicate each learner's weak areas but helps to identify gaps in the weak areas of a whole grade and phase. It gives an idea of the areas of need per class but does not always assist each individual learner, especially the learners who need intensive support and those with learning barriers and challenges or special needs e.g., ADHD, anxiety etc.

The Vygotsky theory claimed that we are born with four elementary mental functions: attention, sensation, perception and memory; and it is our social and cultural environment that allows us to use these elementary skills to develop and finally gain higher mental functions. Vygotsky looked at the social and cultural differences of each learner to gain an understanding of how a child is learning and developing. He thought that the socio-economic status and culture of a learner had a great impact on child cognitive skills. Both researched schools were quintile 5 which means the schools were in a good socio-economic bracket according to the Department of Education. However, the Western Cape Department did not keep track of the socio-economic condition of the area. A few informal settlements had been erected in the surrounding areas, and the schools enrolled most of the children from these settlements. The majority of these learners from the disadvantaged areas had socio-economic barriers which have a huge impact on their learning.

Learners have different learning styles which the assessment did not take into consideration. The needs of learners were constantly changing because of learning methods and limited resources for learners and teachers. Limited resources for learners and teachers in Mathematics impacted on the Systemic Assessment results.

6.6 Discussion

The learners only familiarised themselves with the methods taught in the class. Most teachers do not lead learners with provoking questions to get to the answers. The questions in the Systemic Assessment use different styles and techniques. According to Table 4.10 in Chapter 4, the Grade 3

learners covered more of the Grade 2 Mathematics curriculum than Grade 3 Mathematic. The results presume that the way learners learn has an impact on their performance. Table 4.5 and Table 4.6 demonstrate that learners from both schools find it difficult to answer the component Numeracy Operation and Relationship which is the largest of the five components in Mathematics. A high percentage of learners at both schools struggled to master the basic operations in Mathematics.

According to Bloom taxonomy, four types of questions were asked. Four constructed response questions, one cognitive question and four more complex questions. The results of the Systemic Assessment specifically reflected what the learners remembered of what teachers taught them, which is a learning strategy.

The assessment data are used to improve learning and to make informed decisions about how to improve learning and teaching. The feedback to teachers is pivotal and could be used to strengthen the way teacher teach in their classes. The critical contribution of the Systemic Assessment results is that learners and teachers can gain knowledge and skills from the assessment tools to improve the teaching and learning environment. The fundamental element that connects Systemic Assessment results to enhance teaching and learning is a framework that provides accurate measurement and meaningful feedback on what learners as a class or grade know and can do (Griffin, 2009).

The primary purpose of the Systemic Assessment in Mathematics is to upgrade knowledge, understanding and skills. The Systemic Assessment Mathematics results are used to indicate the level of learning for Mathematics in the grade at the particular school.

School-Based Assessment assists each learner individually (De Lange 2007; Brown et al. (2011). School-Based Assessment refers to assessment as defined in the policy document, National Protocol for Assessment Grades R-12, (Government Gazette No. 34600 of 12 September 2011).

Table 6.1 provides a breakdown of the School-Based Assessment component in the different school phases.

Phase	School- Based Assessment component %	End of Year examination %
Foundation Phase	100	0
Intermediate	75	25
Senior Phase	40	60

Table 6.1*: School-Based Assessment components according to phase.*

(Source: Author's own compilation)

Kilpatrick et al (2001, 372) argued that the teacher's content knowledge in Mathematics is important for effective teaching. A deeper knowledge in Mathematics affects how you teach because the deeper the knowledge is, the more the teacher can draw upon appropriate examples to help the learner.

Through classroom observation and reflection, the researcher learnt that the way teachers teach, and learners learn has an impact on the Systemic Assessment results. The research demonstrates that the setting of the School-Based Assessment questions is differently set from the Systemic Assessment questions. Teachers receive examples of how questions might have been set in the Systemic Assessment afterwards. They do not receive the actual question paper in advance. Grade 3 educators and learners never get to experience the actual setting of the Annual System Assessment question paper.

The teacher worked from a position of informed commitment. The Systemic Assessment takes place before the learners have an opportunity to complete the Grade 3 curriculum. The evidence indicates that the Systemic Assessment is an assessment which serves as an accountability measure to the Education Department in the Western Cape, rather than as a support for individual learners and teachers. It is the assessment of the extent to which the education system achieves pre-determined social, economic, and transformational goals.

The classroom observation implied that there was a considerable disparity between School- Based Assessment mathematical results and the Systemic Assessments results of the Grade 3 learners. The results of the Systemic Assessment are an indication of mathematical skills, abilities and understanding of learner's response to mathematical questions. These assessments are frequently used to measure learners' achievement for educational accountability.

6.7 Recommendations

The Western Cape Department of Education must ensure that teachers address the style or type of question asked in the Systemic Assessment. Systemic Assessment workshops and intervention are necessary to sharpen teaching skills and equip teachers to enhance teaching and learning in Mathematics. To ensure the learning theory, assessment must adapt to current changes in the teaching, learning and curriculum. Learning theory describes how learners receive, process, and retain knowledge during learning. For the Systemic Assessment to support learning; it must enable learners to construct new knowledge. Rather than using the results of Systemic Assessment as an external assessment tool to determine learners' abilities, one of the main aims of assessing learners in Mathematics should be to help the learners to gain a clear insight into a thorough knowledge and understanding of those mathematical principles.

The results of the study indicate that the teaching methodology employed plays an important role in learners learning and understanding of Mathematics. The results of the Systemic Assessment point to a relationship and a connection between teaching methods and results. The evaluation suggests that the findings support the argument of the hypothesis. However, the Annual Systemic Assessment results cannot merely produce the same level of precise accurate assumption about the performance of the individuals, class, or grade within a school as it does for the district or the province levels. In the words of the higher education scholar John Biggs, "What and how students learn depends to a major extent on how they think they will be assessed." (1999, p. 141). Thus, the assessment becomes a lens for understanding learners learning; identifying barriers and helping teachers to improve their teaching approaches.

6.8 Conclusion

In conclusion, the teaching and learning practices in the classroom may influence the results of the Systemic Assessment. The results suggest a correlation between what learners learn and how teachers teach. The classroom observation during Mathematics lessons and the interview sessions with the teachers reveal the gap in, and the range of, knowledge and skills application in the subject. Learners were motivated with low and medium level questions, and high-level questions were rarely tackled. Teachers must ensure that important mathematical practices and processes are evident in assessments by implementing pro-active planning and tackling common misconceptions.

Proactive teaching and planning means that a teacher anticipates what will happen and when, rather than waiting for something to occur and then reacting. Being proactive includes setting goals taking steps towards those goals, and continuously learning and growing.

Meaningful feedback and reflection time is important. Teachers must ensure that the primary purpose of assessment is to improve learners' learning of Mathematics. Learners must develop mathematical competency, solve problems and explore methods of reaching solutions which go beyond simply remembering things. Currently, learners focus on memorising rather than understanding (Crowe et al., 2008). Understanding will enable you to describe something in your own words, and even teach it to others to help them understand the subject. On the other hand, memorizing helps us recall important information at a specific given time. If you have an important test or task to perform, you're likely going to use your memory for it. Systemic Assessment must therefore reflect and reinforce this view of the learning process.

The researcher's analysis of the data suggests that the results of the Systemic Assessment did not indicate an accurate connection of how learners learnt and how teacher taught Mathematics in the Grade 3 classroom. The systemic test is a template or a model for all Grade 3 learners, despite the learner's abilities, culture or background of learning.

The purpose of the collection and interpretation of data was to acquire useful and useable information to make the most informed decision possible. Contradictions and challenges arose from the sources because some Grade 3 teachers, who have been teaching for longer in the grade, have more experience in teaching the Mathematics subject than the novice teachers in the subject.

6.9 Summary

Chapter 6 discussed the data that was analysed in Chapter 5. The researcher described the data and examined all patterns and significances that were identified as related to the research questions. This chapter draws the thesis to a close by answering the research question, highlighting the strengths and limitations of the study, making recommendations and concluding with a summary.

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APPENDIX A: RESEARCH APPROVAL LETTER: CAROL FELIX

Western Cape Government
Education

Directorate: Research

meshack.kanzi@westerncape.gov.za
Tel: +27 021 467 2350
Fax: 086 590 2282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20220715-4296
ENQUIRIES: Mr M Kanzi

Mrs Carol Felix
31 7th Avenue
Grassy Park
7941

Dear Carol Felix,

RESEARCH PROPOSAL: AN ANALYSIS OF GRADE 3 LEARNERS' WAY OF WORKING IN THE ANNUAL SYSTEMIC ASSESSMENT MATHEMATICS WITH THE REFLECTION ON TEACHING AND LEARNING OF MATHEMATICS IN THE CLASSROOM.

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **15 July 2022 till 31 March 2023.**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Mr M Kanzi at the contact numbers above quoting the reference number.
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

The Director: Research Services
Western Cape Education Department
Private Bag X9114
CAPE TOWN
8000

We wish you success in your research.

Kind regards,
Meshack Kanzi
Directorate: Research
DATE: 15 July 2022

APPENDIX B: Ethics: Felix C_HS21_10_85 (5) for Thesis

UNIVERSITY of the WESTERN CAPE

60 YEARS of hope, action & knowledge

01 July 2022

Mrs C Felix
School of Science and Mathematics
Faculty of Education

HSSREC Reference Number:	HS21/10/85
Project Title:	An analysis of grade 3 learners 'ways of working in the annual Systemic Assessment in Mathematics.
Approval Period:	**28 June 2022 – 28 June 2025**

I hereby certify that the Humanities and Social Science Research Ethics Committee of the University of the Western Cape approved the methodology, and amendments to the ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report by 30 November each year for the duration of the project.

For permission to conduct research using student and/or staff data or to distribute research surveys/questionnaires please apply via:
https://sites.google.com/uwc.ac.za/permissionresearch/home

The permission letter must then be submitted to HSSREC for record keeping purposes.

The Committee must be informed of any serious adverse events and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Director: Research Development
University of the Western Cape
Private Bag X 17
Bellville 7535
Republic of South Africa
Tel: +27 21 959 4111
Email: research-ethics@uwc.ac.za

NHREC Registration Number: HSSREC-130416-049

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

APPENDIX C: Information Sheet: Principal

INFORMATION SHEET:

To Principal of school

I am Carol Emily Felix a Master's student in Education (Mathematics Education) at the University of the Western Cape under the Supervision of Dr Marius Simons. As a requirement of the program, I am conducting a research study.

Research Title: An analysis of grade 3 learners' ways of working in the Annual Systemic Assessment in Mathematics.

This study seeks to investigate the reason why the Grade 3 learners' Annual Systemic Mathematics Assessment results are not consistent with the school based assessment results. There is a difference in the results when comparing the two forms of assessment.

This study will aim to suggest a way of working that can influence learner's performance in the Annual Systemic Assessment.

This research will be done by interviewing Grade 3 teachers and observing the teaching and learning of Mathematics in the classroom. Anonymity of the participants of this study is guaranteed and they will not be identified by anything in the study or publication. Participants are welcome to contact details of the researcher and institution if they have any concerns or questions regarding the study.

Researcher: Mrs Carol Emily Felix

Cellular number: 0836510295

Email: carolfelix79@gmail.com

Email: 8519678@myuwc.ac.za

Institution: University of the Western Cape, Faculty of Education, Bellville, South Africa

Institutional Association: Student

or

Supervisor: Dr M.D. Simons

Institution: University of the Western Cape

Faculty of Education

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HSSREC

Research Development

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Privacy Notice

In terms of the requirements of the Protection of Personal Information Act (Act 4 of 2013), personal information will be collected and processed:

What type of personal information will be collected?
Your name, surname, school of attendance, date of birth, grade and any data that can be used to identify a person.

Who at UWC is responsible for collecting and storing my personal information?
The Faculty of Education

Who will have access to my personal information outside of UWC?

Western Cape of Education Department
Researcher: Carol Felix

How long will my personal information be stored?

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Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX D: Information Sheet: Educator

24 May 2022

INFORMATION SHEET: Grade 3 Teachers

Research Title: An analysis of grade 3 learners' ways of working in the Annual Systemic Assessment in Mathematics.

This study seeks to investigate the reason why the Grade 3 learners' Mathematics systemic assessment results are not consistent with the school based assessment results. There is a difference in the results when comparing the two forms of assessment.

This study will aim to suggest a way of working that can influence learner's performance in the Annual Systemic Assessment.

This research will be done by interviewing Grade 3 teachers and observing the teaching and learning of Mathematics in the classroom. Anonymity of the participants of this study is guaranteed and they will not be identified by anything in the study or publication.

Supervisor: Dr M.D. Simons

Institution: University of the Western Cape

Faculty of Education

School of Science and Mathematics Education (SSME)

University of Western Cape

Bellville

South Africa

Tel: (021) 959 2 441

Email: mdsimons@uwc.ac.za

Researcher: Mrs Carol Emily Felix

Cellular number: 0836510295

Email: carolfelix79@gmail.com

Email: 8519678@myuwc.ac.za

Institution: University of the Western Cape, Faculty of Education, Bellville, South Africa

Institutional Association: Student

HSSREC

Research Development

Private BagX17

Bellville 7535

Tel: (021) 9594111

Email:research-ethics@uwc.ac.za

Privacy Notice

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Researcher: Carol Felix

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Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX E: Information Sheet: Parents

INFORMATION SHEET:

Dear Parents

I am Carol Emily Felix a Master's student in Education (Mathematics Education) at the University of the Western Cape under the Supervision of Dr Marius Simons. As a requirement of the program, I am conducting a research study.

Research Title: An analysis of grade 3 learners' ways of working in the Annual Systemic Assessment in Mathematics.

This study seeks to investigate the reason why the Grade 3 learners' Annual Systemic Mathematics Assessment results are not consistent with the school based assessment results. There is a difference in the results when comparing the two forms of assessment.

This study will aim to suggest a way of working that can influence learner's performance in the Annual Systemic Assessment.

This research will be done by interviewing Grade 3 teachers and observing the teaching and learning of Mathematics in the classroom. Anonymity of the participants of this study is guaranteed and they will not be identified by anything in the study or publication. Participants are welcome to contact details of the researcher and institution if they have any concerns or questions regarding the study.

Researcher: Mrs Carol Emily Felix

Cellular number: 0836510295

Email: carolfelix79@gmail.com

Email: 8519678@myuwc.ac.za

Institution: University of the Western Cape, Faculty of Education, Bellville, South Africa

Institutional Association: Student

or

Supervisor: Dr M.D. Simons

Institution: University of the Western Cape

Faculty of Education

School of Science and Mathematics Education (SSME)

University of Western Cape

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Tel: (021) 959 2 441

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Who will have access to my personal information outside of UWC?

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Researcher: Carol Felix

How long will my personal information be stored?

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Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX F Information Sheet: Grade 3 Learner

Information sheet: Grade 3 learner

What is a research study?

Research studies help us learn new things. We can test new ideas. First, we ask a question. Then we try to find the answer.

This paper talks about my research and the choice that you have to take part in it. I want you to ask me any questions that you have. You can ask questions any time.

Important things to know…

- You get to decide if you want to take part.
- You can say 'No' or you can say 'Yes'.
- No one will be upset if you say 'No'.
- If you say 'Yes', you can always say 'No' later.
- You can say 'No' at anytime.
- We would still take good care of you no matter what you decide.

Why am I doing this research?

I am doing this research to find out more about grade 3 learners ways of working in the Annual Systemic Assessment in Mathematics.

What would happen if you join this research?

- I will ask you some questions about how you feel about school.
- How you feel about test, assessments and how you feel about the Annual Systemic Assessment.
- I will keep all your answers and will not show it to your teacher or parent(s)/guardian.
- Only people from the University of the Western Cape working on this study will see them.

Could bad things happen if I join this research?

- Some of the interviews might make you feel uncomfortable or the questions might be hard to answer.
- I will try to make sure that no bad things happen to you.
- You can say 'no' to what we ask you to do for the research at any time and we will stop.

Could the research help me?

I do hope to learn something from this research though. And someday I hope it will help other learners who will also write the Annual Systemic Assessment.

What else should I know about this research?

- If you don't want to be in the study, you don't have to be.
- It is also OK to say yes and change your mind later. You can stop being in the research at any time. If you want to stop, please tell me.
- You would not be paid to be in the study.
- You won't get into any trouble with your teacher, the school or the University of the Western Cape.
- Your parents were asked if it is ok for you to be in this study. Even if they say it is ok it is still your choice whether or not to take part.
- You can ask any question you have now or later.
- If you think of a question later, you or your parents can contact me at.

Researcher: Carol Felix

Email address: carolfelix79@gmail.com

8519678@myuwc.ac.za

Mobile: 0836510295

You can ask questions any time. You can talk to Dr. M.D. Simons mdsimons@uwc.ac.za if you have any more questions concerning this research study.

Is there anything else?

If you want to be in the research after we talk, please write your name below. We will write our name too. This shows we talked about the research and that you want to take part.

Name of Participant _____

(To be written by child)

Thank you

Carol Felix

Privacy Notice

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The Faculty of Education

Who will have access to my personal information outside of UWC?

Western Cape of Education Department
Researcher: Carol Felix

How long will my personal information be stored?

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☐ I do not give consent for my personal information to be collected, stored, processed and shared as described above.

Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX G: Consent Form: Principal

Consent letter

Dear Principal

I would like to express my appreciation on having agreed to your school to participate in the research project being undertaken at your school. My research topic is **"An analysis of grade 3 learners' ways of working in the annual Systemic Assessment Mathematics with reflection on the teaching and learning of mathematics in the classroom."**

This research entails the observation of learners inside the classroom during mathematical lessons.

I will observe grade 3 learners and teachers for a month. I will not be teaching but I will be present in the class of the teacher. I will interview a sample of 8 learners and 3 teachers in the grade 3 classes.

The information obtained from this research will be made available to your school and can be used by the teacher to help the learners being proficient in mathematics.

I would like to thank you in your assistance in this research, and hope that this research make a contribution of some value in helping teachers and the Western Cape Education Department to understand the importance of Annual Systemic Mathematic assessment and teaching and learning mathematics.

Yours Sincerely

If you are willing to allow your school to participate in this study, please sign this letter as a declaration of your consent that your school participate in this project with your permission and that you understand that you may withdraw from the research project at any time. Under no circumstances will the identity of the interview participants be made known to any parties/ organizations that may be involved in the research process.

Principal signature……

Date:……

Researcher's signature……

Yours Sincerely

Information Sheet: Privacy Notice

In terms of the requirements of the Protection of Personal Information Act (Act 4 of 2013), personal information will be collected and processed:

☐ I hereby give consent for my personal information to be collected, stored, processed and shared as described above

☐ I do not give consent for my personal information to be collected, stored, processed and shared as described above.

Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX H: Consent Form: Educator

CONSENT FORM: Grade 3 Teacher

Please read thoroughly and circle Yes or No

1. I, ... voluntarily agree to participate in this research study. Y / N

2. I have had the opportunity to consider the information and asked questions. Y / N

3. I understand that my participation in the interviews is voluntary and that I am free to withdraw at any time Without giving any reason and without being affected in any way. Y / N

4. I understand that relevant data collected from me during the study may be looked at by authorised individuals such as the researcher and supervisor (for purposes such as monitoring the conduct of the research). I give permission for these individuals to have access to data collected during the study. Y /N

5. I understand that all information I provided for this study will be treated confidentially. Y/N

6. I understand that a transcript of my interview in which all identifying information will be confidential Y/N

7. I consent to audio recording being made of these sessions and to these recording being used to aid the research. Y/N

8. I consent to the excerpts from these recording, or description of them being used by the {Researcher: Carol Felix and University of Western Cape} for the purposes the research and /or teaching. Y/N

I understand that the (name of the teacher/learner) staff will be editing out from these recording, or from descriptions of the recordings, as much identifying information as is possible.

Name of Person..... Date..... Signature.....

Researcher Name ..... Date..... Signature.....

Declaration by member by research team:

I, Carol Felix have verbally explained the research to the participate. I believe that the participant understand the study and has given informed consent to participate.

Researchers name: Carol Felix

Signature ..... Date.....

Research Ethics Committee: 021 9594111 Email: research-ethics@uwc.ac.za

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Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX I: Consent Form: Parents

Consent letter

Dear parent

I would like to express my appreciation on having agreed to your child to participate in the research project being undertaken at your child's school. My research topic is"**An analysis of grade 3 learners' ways of working in the annual Systemic Assessment Mathematics with reflection on the teaching and learning of mathematics in the classroom."**This research entails the observation of your child inside the classroom during mathematical lessons.

Your child will be part of the children in the class I will be observing for a month. I will not be teaching your child but I will be present in the class when his/her teacher teaches them.

The information obtained from this research will be made available to yourChildren Schooland can be used by the teacher to help your child being proficient in mathematics.

I would like to thank you in your assistance in this research, and hope that this research make a contribution of some value in helping teachers and the Western Cape Education Department to understand the importance of Systemic Mathematic assessment and teaching and learning mathematics.

Yours Sincerely

If you are willing to allow your child to participate in this study, please sign this letter as a declaration of your consent that your child participate in this project with your permission and that you understand that she /he may withdraw from the research project at any time Under no circumstances will the identity of the interview participants be made known to any parties/ organizations that may be involved in the research process.

Participant signature/ on behalf of the participant……

Date:……

Researcher's signature……

Yours Sincerely

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Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX J: Consent Form: Grade 3 Learner

Assent form: Grade 3 learner participant

What is a research study?

Research studies help us learn new things. We can test new ideas. First, we ask a question. Then we try to find the answer.

This paper talks about my research and the choice that you have to take part in it. I want you to ask me any questions that you have. You can ask questions any time.

Important things to know…

- You get to decide if you want to take part.
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Why am I doing this research?

I am doing this research to find out more about grade 3 learners ways of working in the Annual Systemic Assessment in Mathematics.

What would happen if you join this research?

- I will ask you some questions about how you feel about school.
- How you feel about test, assessments and how you feel about the Annual Systemic Assessment.
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Could the research help me?

I do hope to learn something from this research though. And someday I hope it will help other learners who will also write the Annual Systemic Assessment.

What else should I know about this research?

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- You would not be paid to be in the study.
- You won't get into any trouble with your teacher, the school or the University of the Western Cape.
- Your parents were asked if it is ok for you to be in this study. Even if they say it is ok it is still your choice whether or not to take part.
- You can ask any question you have now or later.
- If you think of a question later, you or your parents can contact me at.

Researcher: Carol Felix

Email address: carolfelix79@gmail.com

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You can ask questions any time. You can talk to Dr. M.D. Simons mdsimons@uwc.ac.za if you have any more questions concerning this research study.

Is there anything else?

If you want to be in the research after we talk, please write your name below. We will write our name too. This shows we talked about the research and that you want to take part.

Name of Participant _____

(To be written by child)

Name of Parents/Guardians_____Signature_____

Printed Name of Researcher _____

Signature of Researcher _____

_____ _____

Date Time

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Name_____

Signature_____

Date_____

Thank you

Carol Felix

APPENDIX K: Semi Structured Interview Questions

Semi Structured Interview Scheduled

Research Topic:

Interviewer: Carol Emily Felix

Interviewee: _____

Interview Date: _____

Interview Location: _____Grade: _____

Section 1

Biographical Data

Gender: [ ]

Age: [ ]

Teaching experience in the grade [ ]

Experience with Annual Systemic Assessment [ ]

Section 2

Purpose of the Annual Systemic Assessment

1. What is your understanding of the Annual Systemic Assessment?

C. Adendorff: Systemic took place to see if the curriculum is covered.

R. January: To assess the system or curriculum.

C. Peters: Systemic helps to gauge the dept where we are in terms of our literacy and numeracy. It is used as an instrument measuring to help identify where the gaps are and to find ways to bridge the gap.

S. Manuel: It is an assessment done annually to ascertain the level of the learner's performance. To measure the standard and see if the education system is working. The systemic testing also gives us an understanding of the strengths and areas of need of the learners at a particular school in a particular grade and helps educators

to set new goals and zoom in on areas of need indicated the following year.

2. What do you think is the purpose of the Annual Systemic Assessment?

C. Adendorff: To assess the system

R. January: To assess the system.

C. Peters: It is to benchmark performance and track and to track how we perform in Maths and English in our schools, in our Department and I n our province. Since these are the major concerns in Maths and English. Literacy and Numeracy is very low and must improve.

S. Manuel: The purpose of the Annual Systemic Assessment is to measure the level of the learners and see if the school is an underperformed school or a performing school. The test also allows the teachers to know which areas they ret each, consolidate and start improving in, in the phase.

3. In your opinion how is the Annual Systemic Assessment different from the other assessments at school level?

C. Adendorff: Yes, the assessment at school differs with practical task. The methods are continuing. The system of the systemic assessment is very high.

R. January: Assessment at school is controlled via the educator and the method is continues systemic is a formal assessment and the standard is high.

C. Peters: Yes, It's different it creates lots of added pressure for the grade 3's. The questions asked or posed differ at times. Strict time constrains learners feel uncomfortable and don't ask clarity. Lots of pressured it placed on them to performed.

S. Manuel: The Annual Systemic Assessment gets done annually usually in the third term towards the end of a particular phase e.g., Grade 3 and Grade 6 (End of Foundation and Intermediate Phase) to test the system and the phase. However other tests done quarterly are to test the learner's understanding of the content taught based on the prescribe guidelines and milestones indicated in the CAPS.

Section 3

Mathematics Assessment practice

1. What in your view are the important elements of assessment?

C. Adendorff: If the child knows the work.

R. January: To test if the learners know their work.

C. Peters: To see if the learners' grasp

S. Manuel: Firstly, do administer an assessment on the content taught. Thereafter mark the assessment and do an item analysis to understand the new areas of development

then ret each consolidate and ret each. Also, a form of self-evaluation.

2. How do you provide time for learners to reflect on **how** they have learned during a Mathematics lesson?

C. Adendorff: Grouping

R. January: Work in ability groups.

C. Peters: We practice the questions over and over. Show the learners common mistakes made and help them to rectify it.

S. Manuel: I give learners the opportunity to do demonstrations on the board of different methods and Mathematics strategies. I would present each group with a problem and get them to do the sum/ problems on newsprint and then come and explain to the rest of the class in their allocated groups. Also, through exercise of doing task and daily correction. During group work (mat work they also given the time to reflect on what they have learnt.

3. How do you provide time for learners to reflect on **what** they have learned during a Mathematics lesson?

C. Adendorff: Make use of the intervention.

R. January: Make use of intervention.

C. Peters: Asking them the importance of work covered. How can they relate to it Extra time for slow learners.

S. Manuel: They are given the opportunity weekly via weekly test and informally as well as quarterly.

4. What scaffolding do you provide for learners to support them in reflecting on and discussing their learning?

C. Adendorff: Differentiated questions

R. January: Oral differentiated questions.

C. Peters: Slowly increase number ranges and slowly makes the work more challenging, step by step.

S. Manuel: I make use of facial expressions, affirmation, gestures and higher and lower questioning styles (Literal questions) I also use peers to assist in scaffolding.

5. How can you improve your practice across the Mathematics curriculum in the area of assessment?

C. Adendorff: scaffold your questions.

R. January: scaffolding your questions.

C. Peters: Workshop parents because they need to familiarise themselves with the methods

taught in class.

S. Manuel: Attending training and workshops offered on mental strategies to stay up to date and acquire more skills to show learners a variety of Mathematics strategies in class. Attend training sessions on how to teach the concept measurement better (capacity, time etc) and also to mentor novice teachers in the phase.

Section 4

Evaluation of data

1. How do you analyse the diagnostic results of the Annual Systemic Assessment?

C. Adendorff: Analysis of results.

R. January: analysis of the results

C. Peters: We look at the results and have an in-depth discussion at staff level and grade level.

S. Manuel: By having a phase meeting discussing the areas of need and highlighting lowest percentage scored. There after unpacking the question zooming in on the topics e.g., Numbers Operation, patterns act. Then I would type up the areas of need and come up with suitable intervention plan to address the areas within the phase from the bottom e.g., Grade 1 and monitor intervention books to see if topics are covered.

2. Do the diagnostic results allow you to assist the individual learner to improve in their learning?

C. Adendorff: Not providing for individuals results.

R. January: I only see the data; therefore, I do intervention on the gaps.

C. Peters: It does not indicate each learner's weak areas but helps to identify gaps in the weak areas as a whole of the grade and phase.

S. Manuel: It gives an idea of the areas teachers focus on but does not always help to assist each individual learner especially the learners needed intensive support and with learning barriers and challenges or special needs e.g., ADHD, anxiety etc.

3. What impact does the Annual Systemic Assessment process have on the learner and the teacher?

C. Adendorff: additional workload.

R. January: Additional workload and preparation.

C. Peters: It helps learners to ensure that the work is covered and help teacher to teach the required concept in the curriculum.

S. Manuel: It creates an immense amount of stress and anxiety and teachers are burnt out trying to push and teach as much content during the grade 3 year and even and

even trying to teach grade 4 work. Learners are drained and tired because of the immense number of concepts and content they need to know by the last term. Learners are expected to do more in the grades they are tested e.g., Grade 3 and grade 6 and the fatigue kicks in by both teachers and the learners.

4. Do you think that the Annual Systemic Assessment results are a true reflection of the class performance?

C. Adendorff: No, the systemic assessment includes the intersen (grade 4) work.

R. January: No as the system include Intersen curriculum.

C. Peters: No because learners feel pressured, overwhelmed stressed and do not finish all the answers. It can be very stressful to them.

S. Manuel: I do not think it is a true reflection as certain learners are transferred in and are maybe underperforming already. About 8-10 learners per class are learners at risk that have learning barriers and special needs to be on Ritalin and perhaps even need a scribe to complete their test. Some need placements at special schools but not exempted from wring the test and score bring the marks of the class and the phase down. Learners are tested on the same test which is not fair are they are grouped according to the abilities their entire schooling career but expected to write the same test at the same level and in a short time. some learners have severe reading challenges and gets no assistance with the reading of instructions hence they are unable complete the test. Many learners are not ready for the grade and have progressed with support and are also expected to write the same test. Some learners suffer from anxiety and don't do well under the formal setting and having strangers administer the test also creates an immense amount of anxiety and stress for the learners and they perhaps make many errors. If learners are unable to read fluently in the time prescribe time.

5. Does the Annual Systemic Assessment result reflect the way teachers teach and learners learn?

C. Adendorff: No

R. January: No

C. Peters: Yes we do cover all the work per the Caps requirements. There are many factors at play when looking at the systemic results. Parents not assisting and not doing homework also an impact on results.

S. Manuel: At time it could but there are many factors that influence. Also, the way questions are posed could be much different to the way they are familiar with.

Section 5

Prospects

1. In your opinion what opportunities are presented to you as a Mathematics teacher, by the Annual Systemic Assessment?

C. Adendorff: None, we do not see the assessment or the scripts of the assessment.

R. January: None as we do not see the assessment scripts or receive feedback on the scripts that was mark.

C. Peters: Finding sufficient time work through the curriculum. Learners work at a very slow pace. Having to reteach certain concepts and doing sufficient.

S. Manuel: No opportunities as we are allowed to see the setup of an actual systemic paper which could perhaps assist us as teachers. We are however constantly exposing learners to a variety of methods and strategies to be prepared for the possible type of questions asked. Workshops on Mathematics and mental starters and training sessions are offered by the Western Cape Education Department.

2. How do such opportunities enhance your teaching?

C. Adendorff: None

R. January: None

C. Peters: Helps you to ensure intervention strategies and activities are drawn up effectively consolidation and intervention before moving on to new work. Learners struggle to read the questions.

S. Manuel: Improve our own teaching styles and methods

3. Does the Annual Systemic Assessment allow you to address the individual leaner common misconceptions or knowledge gaps efficiently?

C. Adendorff: No

R. January: No

C. Peters: The Systemic results are very dear when indicating the gaps. Time constrains oversized classrooms and learners with learning barriers make it a cumbersome task. The demands are great and putting intervention in place is so difficult.

S. Manuel: It gives an overview but does not allow us to support the learners who actually wrote the test the previous year individually. Those learners go to the next grade. We also get an overview of the heading (concepts) learners struggles with e.g., Time (passing of time) but not an example of the actual questions to see how it is phrased.

Section 6

Challenges

1. How do you cope with the preparation for the learners of the Annual Systemic Assessment?

C. Adendorff: By teaching the skill of problem solving.

R. January: Teaching the skill of problem solving.

C. Peters: It is extremely daunting and tiring process lots of extra marking, admin and lots of extra work.

S. Manuel: There is constantly an immense amount of work and testing and marking. At times I feel extremely overwhelmed not with the teaching but the actual testing and marking. Learners are constantly under scrutiny and inspection as well as grade 3 teachers. Learners test results and analyses must be done all the time making my job unpleasant at times. the amount of testing creating poor relationships with parents as they constantly have to do homework and study and prepared them for the test. It is tiring and normally the grade 3 teachers are overworked and never really truly appreciated unless the results are high. The way I cope is to workshop parents on my strategies to teach them so that they can assist the proper way with homework and be on the same page. I start stories and questions from the start of the year trying to make them familiar to systemic type of question paper with three reading pieces. I try to focus on the areas the learner underperformed in the previous year. I also find learners that learners do not know concepts taught in grade 1 and 2, setting me as a teacher back immensely with time. I feel the grade 3 teachers are expected to do the bulk of the curriculum and teach grade 1, 2 and 3 works to get them ready for systemic test covering work up to grade 4.

2. Has the implementation of the Annual Systemic Assessment been effective?

C. Adendorff: No

R. January: No educators become overwhelmed.

C. Peters: It gets learners to focus more but they feel pressured and often don't finish.

S. Manuel: I think the systemic test implementation has not been effective most times due to factors such as covid last year and other factors which could influence learner's performance which is out of the teacher's hand. It gives an idea but is not always a true reflection of how good the teachers teach and how strong the learners are. It also depends on the type or quality of learners the teachers get each year. Naturally some classes are stronger that others due to the fact their foundation has been laid well, more experienced teachers or good teachers. Some learners' teacher years

were interrupted by class teachers leaving the school due various reasons and learners transferred to other schools also due to various reasons. The learners who had a disruptive year would most likely not perform as well as the learner or class who were stable.

3. How do you feel about the WCED Annual Systemic Assessment plan?

C. Adendorff: They must test the weak learners on another level.

R. January: The weaker learners are catered for.

C. Peters: It is a good way to ascertain how we are performing as a school but it is very taxing since the Curriculum is already time constrains to cover the work and overloaded with content.

S. Manuel: I feel their plan is unreasonable and they should consult with the actual grade with the actual grade teachers when setting up an actual systemic plan and even systemic test assessment as they are the most experienced and knowledgeable teachers. I feel the systemic testing is very clinical and should not be marked by people out of the teaching profession as it is instead having grade 3 teachers mark it perhaps retired grade 3 teacher.

4. What challenges are you experiencing with Annual Systemic Assessment?

C. Adendorff: Reading challenges and time management

R. January: Many learners have reading challenges and time management is a challenge.

C. Peters: having to deal with the learners who have learning difficulties.

S. Manuel: Learners awaiting placement, learners with severe anxiety disorders, learners with ADHD unable to focus for even short periods of time. Learners with learning disabilities that cause learners not to learn as they should. Learners from the informal settlement getting no assistance from home also having learning barriers. Huge challenge is to prepare learners on grade 1, 2, and 3 levels in the same class for the same systemic paper as well as learners with reading barriers and poor comprehension skills. Other challenges are poor parental support, content overload and too much testing and admin for the teacher.

5. What changes could be made to help teachers with the Annual Systemic Assessment?

C. Adendorff: The question level of the Mathematics is a challenge and the content is not relevant to the learner.

R. January: The higher order questions are challenge. Context is sometime not known to learners.

C. Peters: Extra assistance would be great. Each grade 3 needs a highly skilled trained and

competent assistant tutors to help challenged learners one on one help.

S. Manuel: Give teachers past systemic assessment papers to work through and see the questioning techniques and styles. The teacher has no idea of the structure and the set of the actual systemic assessment. Get input on setting up the test from grade teachers. Get a sort of test done each year not only grade 3 to get all teachers to prepared learners well during the year not only in grade 3. I suggest that the test be done over a longer period of time not two intense test p on one day. Drop the actual grade 3 and grade 6 systemic tests and implement a yearly test for each grade like the ANA test. This will also encourage teaches to improve their teaching styles and improve and obtain good results.