

THE SCHOOL STAKEHOLDERS' PERCEPTIONS OF THE ROLE OF PRINCIPALS IN  
IMPROVING GRADE 6 PERFORMANCE IN MATHEMATICS

BY

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## DECLARATION

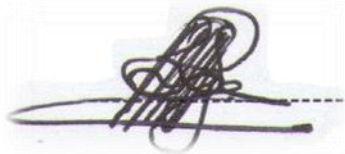
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Dr Paul Karel Triegaardt

Date: 18 February 2021

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## **ABSTRACT**

Primary school mathematics continues to perform poorly regardless of all the government's efforts in providing most of the basic resources at schools. Teachers are working tirelessly in teaching the learners and using all strategies, but still, there is no improvement in the mathematics results. Research has shown that primary schools nationally have persistence of underperformance and continue to perform below the Mpumalanga Province's set standards. This research seeks to investigate the role of principals in managing the factors that contribute to poor mathematics performance and finding out strategies and approaches that principal can implement to improve mathematics performance and serve as a guideline to primary school principals in Mpumalanga. A qualitative approach was used for this study as it allowed the researcher to conduct in-depth interviews through Microsoft Zoom with five principals, five deputy principals, and five Grade 6 mathematics teachers. Relevant school documents were also examined to collect more data. The research indicates that most schools understand the importance of HODs' training or support in improving mathematics performance, yet they lack a structured implementation framework for HODs' training. The study recommends that schools, circuits, and districts need to work together to plan, co-ordinate and implement an HOD training programme according to each sector's uniqueness.

Keywords: HOD training; improvement strategies; leadership; management; mathematics, mathematics specialisation; performance; programmes; recruitment; technological resources; vision

## ISIFINYEZO

### INDIMA ENGADLALWA UBUHOLI BUKA THISHA-NHLOKO EKUTHUTHUKISENI IMIPHUMELA YABAFUNDI KUSIFUNDO SEZIBALO EMPUMALANGA

Isifundo sezibalo ezikoleni zamabanga aphantsi siyachubeka nokungaphumeleli kahle nanoma uHulumeni azame yonke imizamo ngokuthi ahlinzeke ngezinsiza ezingumgogodla zokufunda. Othisha basebenza ngokuzikhandla, ekufundiseni abafundi nasekusebenziseni zonke izindlela zokufundisa, kodwa umehluko kumiphumela awubonakali. Ucwangingo lubonisile ukuthi isifundo sezibalo ezikolweni zamabanga aphantsi kumiphumela yazwelonke, sichubeke njalo nokungaphumeleli kahle uma kucathaniswa namazinga abekiwe eMpumalanga. Lolucwangingo-sifundo luhlose ukuthola izindlela zobuholi buka thisha-nhloko ukubhekana nezingcinamba ezibangela ukungaphumeleli kahle kwalesifundo, nokuthola izindlela ezintsha ezingasetshenziswa ngothisha-nhloko ekuthuthukiseni imiphumela yesifundo sezibalo ezikolweni zamabanga aphantsi e Mpumalanga. Ucwangingo olukhethekile yiyona ndlela esetshenzisiwe kulolucwangingo-sifundo ngoba luvumela uhlobo-olunye olujulile olwenziwe ngezindlela zesimanje zobuchwepheshe babongcondo-mshini (Microsoft Teams). Kusetshenziswe izikole eziyisihlanu, othisha-nhloko abayisihlanu, amasekela othisha-nhloko ayisihlanu kanye nothisha abafundisa izibalo ebangeni lesithupha abayisihlanu. Izincwadi ezigcina imininingwane yesikole nayo isetshenzisiwe ekutholeni olunye ulwazi ngesikole. Imiphumela yalolucwangingo-sifundo ingakwazi ukusiza othisha-nhloko ukuthi benze ngcono imiphumela yesifundo sezibalo ezikoleni zamabanga aphantsi. Lolucwangingo lubonisile ukuthi kubalulekile ukuvivinywa kwamabaphathi bezigaba esikoleni (HODs). Lolucwangingo lubonisa ukuthi kudingeka uhlelo lokubacecesha ngoku hlela, nokuchumanisa, nokuyiphumelelisa lendlela yokucesha abaholi bezigaba.

Amagama angukhiye: Ubuholi; impumelelo; ukuphatha; izindlela zokuthuthukisa; isifundo sezibalo; Umbono; Izinhlelo; Ukuncengwa kothisha; Izinsiza- kufundisa zobuchwepheshe; Ukuceshwa kwabaholi bezigaba; Ubuchwepheshe esifundweni sezibalo.

## SIFINYETO

INDZIMA LENGADLALWA NGUBOTHISHELA-NHLOKO EKUTFUTFUKISENI  
MIPHUMELA YEBAFUNDZI BELIBANGA LESITFUPHA ESIFUNDVWENI SETIBALO  
EMPUMALANGA

Sifundvo setibalo etikolweni temabanga laphansi sichubeke njalo nekungaphumeleli ngendlela lefanele nanome Hulumeni aniketele nangatotonke tinsita letidzinge kako letingumgogodla wemfundvo. Bothishela basebenta ngekutikhandla ekufundziseni bafundzi nekusebentisa tindlela letahlukahlukene tekufundzisa, kodvwa miphumela ayibonisi kutfutfuka. Lucwaningo lubonisile kutsi sifundvo setibalo kuvelonke siyachubeka nokutfolela miphumela lengaphansi kwelizinga lelibekiwe eMpumalanga. Lelicwaningo libukelele kuhlola indzima lengadlalwa bothishela-nhloko ekulweni netingcinamba letibangela kungaphumeleli kahle, nekutfolela tindlela tekutfutukisa tibalo letingaphindze tisetjentiswe ngubothishela-nhloko njengemhlahandlela longalandzelwa tikolwa ekutfutukiseni kwesifundvo setibalo. Indlela yolucwaningo lesentjentiswe yenta kutsi mcwaningi akwati kuchuba tingcoco letijulile ngendlela yebuchwepheshe (Microsoft Zoom) nabothishela-nhloko, masekela abothishela-nhloko nabothishela belibanga leitfupha. Tincwadzi letigcina mininingwane yesikole nato tihloliwe ngumncwaningi kutfolela leminyane mininingwane. Lolucwaningo lubonisa kutsi tikolo tivisisa kubaluleka kokuceceshwa kwebaholi betigaba (HOD), kodvwa tikolo atinato tinhlelo tokubacecesha. Lolucwaningo lusekela kutsi siyingi (District), iSekhethi netikolo kufanele tibe netinhlelo, nendlela yokuchumanisa, nokuyisebenta ngekucecesha baholi betigaba (HODs).

Magama lakhetsekile: Buholi; Imphumelelo; Kuphutsa; Tindlela tekutfutukisa; Sifundvo setibalo; Mbono; Tinhlelo; Kunxenkwa kwabothishela; Tinsita tebuchwepheshe; Kuceceshwa kwebaholi betigaba; Buchwepheshe kutetibalo.

## **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

ANA	- Annual National Assessment
CAPS	-Curriculum Assessment Policy Statement
HOD	- Head of Department
LTSM	- Learner Teacher Support Materials
MDE	- Mpumalanga Department of Education
NEEDU	- National Education Evaluation and Development Unit
NQF	- National Qualification Framework
REC	- Research Ethics Committee
SASA	- South African Schools' Act
SDT	- School Development Team
SGB	- School Governing Body
SIP	- School Improvement Plan
SMT	- School Management Team
UNISA	- University of South Africa



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# CHAPTER ONE: ORIENTATION TO THE STUDY

## 1.1 INTRODUCTION AND BACKGROUND

Schools in the Mpumalanga Education system have changed remarkably since 1994. Jansen and Taylor (2003:2) mention and discuss the following changes in the South African Education system: the creation of a single National Department of Education out of 19 racially, ethnically, and regionally divided Departments of Education and one such accomplishment was the National Qualification Framework (NQF) that has become an important lever for systems change through qualification reform.

However, teaching and learning did not improve a lot, and this made the role of principals to improve mathematical results very difficult (Marishane & Botha 2011:50). Principals have to direct schools towards effective teaching and learning to be agents of change. The principal needs to allocate work to teachers in line with their knowledge and abilities. The principal should create a climate of stability by ensuring that the instructional programme follows a schedule, and that tasks are completed. The principals also have to redesign the organisation and develop people. Leadership creates the conditions under which teachers can work effectively (school environment conducive to teaching and learning)(Marishane & Botha 2011:50).

Management includes the design of school improvement strategies, implementing incentive structures for teachers and support personnel, recruiting and evaluating teachers, brokering professional development strategy, allocating school resources towards instruction and buffering non-instructional issues from teachers (Marishane & Botha 2011). Drucker (2016) explains that management and leadership are two different ways of organising people." Leadership is setting a new direction or vision for a group that they follow, for example, a leader is the spearhead for that new direction. On the other hand, management controls or directs people or resources in a group according to principles or values that have already been established". Furthermore, he adds that the manager uses a formal, rational method whilst the leader uses passion and stirs emotions. Lastly, he comments that leadership is one of the several facets of management". Often the same people wear different hats – both leader and manager – at different points in time. Although not essential, it certainly helps a manager if he/she is also a good leader. Conversely, leaders do well if they have some



degree of management skills because it helps them to envision the implementation of their strategic vision.

Principals need to ensure that schools have functional curriculum management systems in place with effective guidelines for policy implementation. This could ensure that curriculum implementation and monitoring are functional. Principals and HODs are expected to provide leadership in setting school policies, procedures and practices, which are designed to facilitate effective and efficient delivery of the curriculum. Poor curriculum management produces a "lag" (Marishane & Botha 2011).

In 2013, the National Education Evaluation and Development Unit (NEEDU) evaluation of rural schools once again found that there is insufficient writing in Grade 5 learners' mathematics exercise books (NEEDU Report 2013:18). At the schools where the research was conducted, the home language is siSwati. Learners in the foundation phase are taught in siSwati and when they get to Grade 4, they switch to English. One major challenge between the two phases is concept building. "Foundation" is defined as a "solid ground or base" on which building rests (*South African Oxford Dictionary* 1988:296). Based on the definition, the foundation phase is what the intermediate phase will build on, and all the other phases and levels. The mathematics concepts in the foundation phase have no relation with the concepts in the following grades.

Table 1.1: Taken from the siSwati CAPS document, Grades R–3

English	Triangle	Rectangle	Shapes	Fractions	Oval
siSwati	Calantsatfu	Calandze	Bobunjwa	Tincephu	Sacandza

In 2012, a NEEDU team visited selected schools in the Ehlanzeni region to evaluate the status of teaching and learning. The NEEDU research was based on the Annual National Assessment (ANA), after being analysed by the educational authorities. The NEEDU team was recommended by the Ministerial Committee of Education "to report to the Minister of Education with an authoritative, analytical and accurate account on the state of schools in South Africa" (NEEDU Report 2013:18). The following challenges were raised in the report:

- Learners are unfamiliar with mathematical terminology and properties are often used incorrectly.
- Basic algebraic skills were not mastered, e.g. the correct use of the language

of mathematics, number vocabulary, number concept calculation and application skills, investigate, analyse represent and interpret information, pause and solve problems and an awareness of the important role that mathematics plays in real life situations (NEEDU Report, 2013).

- Learners do not know how to solve applications in geometry and problems involving spatial manipulations.

Reddy (in Siyepu 2013) states that there is no single cause for South Africa's poor and diverse performance. Preliminary explanations could be linked to multiple, complex and connected sets of issues, including the following: issues of poverty, resources and infrastructure of schools, low teacher qualification, and poor learning cultures at schools. Language proficiency is a contributory factor, but the issues of conceptual and cognitive demands placed on learners in classrooms seem to be significant.

The above statements are supported by Van der Walt, Maree and Ellis (2008) and Ndlovu (2011, in Siyepu 2013), explaining that factors contributing towards poor mathematics achievements are poor socioeconomic background, lack of appropriate learner support materials, general poverty of the school environment, general poor quality of teachers and teaching, language of instruction and inadequate study orientation.

International reports also confirm that mathematics results in South African schools are poor, as reflected in TIMSS Numeracy and SACMEQIV study. These results should not be seen in isolation to other systematic improvements in the education sector and from those reflected in the performance of South African learners in their international programmes (NEEDU Report 2013:18).

Minister Angie Motshekga, when releasing the Annual National Assessment (ANA) results for 2013, sited that achievement amongst Grade 6 and 9 learners in mathematics was much lower and demonstrated a fairly limited repertoire of necessary basic skills and knowledge. She further said this was a signal warranting particular attention (South African News 2014:2). According to many researchers, assessors and reports, mathematics performance shows no improvement, despite the Department's efforts to provide workbooks, textbooks and exercise books in time, and giving ANA exemplars for practice. Schools try to get well-qualified maths teachers, and they work

hard, extra time to improve maths, but in vain. The 2013 ANA results released on 05 December 2013, show that learner achievement in the intermediate phase (Grades 4–6) in general displayed wide-ranging deviancies in basic knowledge and competencies. The mathematics achievement of Grade 6 learners was much lower, with only one out of ten learners achieving an adequate and higher level of performance (South African News 2013:2). In my study, I want to investigate the role of school principals in improving the poor mathematics results of Grade 6 learners at rural schools in the White-Hazy Circuit.

“There is increasing recognition that effective leadership and management are vital if schools are to be successful in improving good learning opportunities for students. There is also emerging evidence that high quality leadership makes a significant difference to school improvement and learning outcomes.” (Bush, Kiggundu & Moorosi 2010). Bush highlighted the following roles of principal in improving teaching and learning:

- Modelling good practice in classrooms.
- Observing educators’ practice and providing constructive feedback
- Monitoring and evaluating learner outcomes and putting in place strategies to address weaknesses (Bush *et al.* 2010)

## **1.2 RATIONALE FOR THE STUDY**

This study seeks to investigate the stakeholders’ perceptions of the role of principals in improving Grade 6 learner performance in mathematics. The strategies and approaches those principals can implement to improve mathematics performance will serve as a guideline to primary school principals in Mpumalanga.

Research results has shown that there is a persistent of underperformance of mathematics in the Mpumalanga Province. International reports also confirm that mathematics in South African schools are poor, as reflected in TIMSS Numeracy and SACMEQIV study. These results should not be seen in isolation to other systematic improvements in the education sector and from those reflected in the performance of South African learners in their international programmes (NEEDU Report 2013:18)

Minister Angie Motshega, when releasing the Annual National Assessment(ANA) results for 2013, sited that achievement amongst Grades 6 and 9 learners in mathematics was much lower and demonstrated a fairly limited repertoire of necessary basic skills and knowledge, and this warrants particular attention (The South African News 2014).

One of the factors that contribute to poor performance mentioned in the above study is the lack of effective School Management Teams (SMTs) to provide effective leadership, which correlates with the aim of this study, namely the role of principals to improve inadequate intermediate phase mathematics results at Mpumalanga primary schools. Most of the schools in the Mpumalanga, White-Hazy circuit underperform in mathematics, below the set circuit target, which is 75%. The principals, deputy principals and Grade 6 mathematics educators at the schools in the circuit are then selected to share their expertise regarding teaching, management and leadership skills in relation to mathematics performance.

### **1.3 STATEMENT OF THE PROBLEM**

McMillan and Schumacher (2010) define a research problem as a clear, concise statement, which is crucial, because it communicates to others the focus and importance of the problem, the educational context and scope, and the framework for reporting the results. With all the efforts from stakeholders combined to improve mathematics performance, schools still perform poorly (Pulse 2011). Like the Department of Education in Mpumalanga, school management teams and parents try to fulfil their roles. The Mpumalanga Department of Education provides schools with resources such as exercise books, textbooks, workbooks and support materials as early as October to November every year (LTSM), to improve the level of mathematics performance. However, there is no improvement; as mentioned above, the mathematics achievement score for different grade levels across the school system remains around 30% and 40% (NGO Pulse 2011:1). Parents support the schools by encouraging learners to attend, do their homework, and by visiting the schools to view learners' work and provide uniform. School management teams are trained on how to improve their management skills and improve the results, but nothing seems to change the situation (NGO Pulse 2011:1). Since the problem continues despite the intervention and support of the Mpumalanga Department of Education, the factors that

contribute to the poor mathematics performance in the intermediate phase at selected primary schools in the White-Hazy Circuit need to be researched.

Teaching of mathematics in Grade 6 is a challenge because of the following reasons:

- Teachers lack specialisation in mathematics, Nkosi (2012)
- The language of teaching and learning has changed from the mother-tongue to English, learners still struggling with concept building (Berger (2014)
- Lack of parent involvement, Gentry (2011)
- Teachers are not involved and well trained on the implementation of a new curriculum, Moodley (2013)
- The attitude of teachers and learners on the subject, Cheprasov (2018)

Principals contribute to the poor performance of Grade 6 mathematics because they lack skills to:

- Effectively involve parents in their children's' education.
- To motivate teachers and learners to change their attitude towards mathematics'
- To motivate teachers to register and study as mathematics specialists and to recruit specialised mathematics teachers.
- To influence and guide teachers to build the mathematical concepts using the English in the foundation phase in consultation with parents.
- To motivate and outsource specialist on the new curriculum to workshop the teaching staff, and to encourage them to attend developmental workshops.

The research problem or statement therefore introduces the reader to the importance of the problem. It is also placed within an educational context and provides the framework for reporting the results. This statement should be clear and unambiguous (Mouton 2008). The problem statement was formulated as the main research questions for this research:

What are the school's stakeholders' perceptions regarding the role of principals in improving Grade 6 learner performance in Mathematics?

The research was guided by the following sub-problems:

- What are the characteristics of an effective principal?
- Why can principals contribute to the poor mathematics results in the intermediate phase at primary schools?
- How can principals and teachers improve the poor results of intermediate phase learners at primary schools?

Having stated the research problem and sub-problems, the aims and objectives pertaining to the role of the principal to improve the performance of Grade 6 learners in mathematics were formulated in order to help the research to focus more clearly on the problem.

#### **1.4 AIMS AND OBJECTIVES OF THE STUDY**

This study seeks to investigate the school's stakeholders' perceptions regarding the role of principals in improving Grade 6 learner performance in Mathematics.

Ntshoe (2014:482) confirms that

Instructional leaders, who consistently emphasize, articulate, and boost teaching practices, which research identifies as instructional best practices, can increase their teacher's command of their subject specialisation and content-related matters.

The following aims and objectives were identified for the study:

- To briefly discuss the characteristics of an effective school principal.
- To explore why principals can contribute to the poor mathematics results in the intermediate phase at primary schools.
- To make recommendations on how principals and teachers can improve the poor results of intermediate phase learners at primary schools.

In this section, the researcher reviewed the aims and objectives of the research.

#### **1.5 THE SIGNIFICANCE OF THE STUDY**

The study will allow stakeholders to work together and share expertise, as one principal of Whole-School evaluation (WSE) explains. School management teams (SMTs) and all the stakeholders of a school to initiate, plan, implement and manage change at schools. It also assists all the stakeholders to exercise greater control over

change, thereby enabling them to cope with it. School developmental teams (SDT) encourage school stakeholders to organise programmes of development of teachers. Improvement and change consequently progress and the achievement of learners is enhanced as a result of these programmes.

All the stakeholders are made aware that schools need to be evaluated in their entirety; there is no room for individuals. For instance, they develop a sound knowledge of all the aspects that contribute to the existence of schools. These aspects include the basic functionality of schools, curriculum provision and resources relationships between governance and management educator development, as well as learner achievement and parents' and communities' involvement. In this regard, post – apartheid education dispensation of laws and education policies also stress the involvement of all the role-players in education, which is a paradigm shift from the legacy of apartheid to a democratic dispensation (DOE 2000:19). The Department of Education also stresses that SMTs in the new education dispensation are not regarded as the only people with a responsibility to manage change at schools, but other stakeholders also need to be actively involved.

In addition, all the stakeholders are made aware of the importance of participatory management and dispersed leadership as a point of departure in giving people within an organisation an opportunity to utilise their capabilities, potentials and expertise (Bell 2004:33). This therefore instils a sense of ownership of the school in all the stakeholders. Finally, the involvement of all the stakeholders in managing change at schools minimises the risks of resistance to change by some individuals as they realise that their opinions are valued.

## **1.6 RESEARCH METHODOLOGY AND DESIGN**

### **1.6.1 Research design**

A research design is defined as a plan for selecting subjects, research sites, and data collection strategies and procedures to answer the research questions (McMillan & Schumacher 2010; Marshall & Rossman 2011). Creswell (2009) explains that the research plan relates to the specific procedures involved in the final three steps of the research process: collection of data, analysis of data, and reporting. I will employ the following steps in my proposed study: collect, analyse, interpret and present the

research data in response to the research questions, (Creswell 2009; McMillan & Schumacher 2010; Marshall & Rossman 2011). The purpose of a research design is to specify a plan for generating empirical evidence that will be used to answer the research questions (McMillan & Schumacher 2010). Interpersonal emotions in fieldwork are essential in data collection activities because of the face-to-face interaction (McMillan & Schumacher 2010). For the purpose of this study, the I have chosen the qualitative research design because it investigates the perceptions of teachers and scholars. For this purpose, the I will follow a case study design in doing interviews at five primary schools in the White-Hazy circuit in the Mpumalanga Province. I analysed school documents, such as minutes, school policies, departmental circulars and record books.

### **1.6.2 Research approach**

Maree (2007:51) explains that qualitative approach as a research methodology is concerned with understanding the process of social and cultural context, which underlines various behavioural patterns and mostly explores the “why” question of research. The research design describes the procedures for the study and includes how the participants and data will be collected by the researcher. This approach assists in creating insight into understanding the managerial role of the principal in improving learners’ mathematics results at rural Mpumalanga primary schools. My study is therefore a qualitative study and also exploratory by nature (McMillan & Schumacher 2010). I will therefore endeavour to listen to principals to create an understanding based on their ideas and recommendations of the role of the principals in improving Grade 6 learners’ mathematics results at rural Mpumalanga primary schools.

In this research project, qualitative approach was deemed the most suitable, because it afforded school stakeholders an opportunity to define their own perceptions and the problems they encountered at their organisations, since the study was designed to be exploratory and descriptive, the data were collected and analysed using approaches typical of qualitative design. These approaches aimed to understand human phenomena and investigate the meaning that people gave to events they experience in their working environments. De Vos (1998:80) maintains that qualitative study aims to understand and interpret the meaning the subjects give to their everyday lives.



Due to the qualitative nature of the study, I employed a phenomenological approach. This approach, according to Denscombe (2007: 576), focuses on how life is experienced. It also deals with people's perceptions or meanings, attitudes and beliefs, feelings, and emotions. Furthermore, it is associated with humanistic research using qualitative methodologies. Phenomenology is also viewed by Creswell (2009:13) as a strategy of inquiry in which the researcher identifies the essence of human experiences about a phenomenon as described by the participants.

A literature study provides a framework for establishing the importance of the study as well as a benchmark for comparing the results with other findings (Creswell 2009:25). For this study, information on stakeholder involvement towards effective management of change at White-Hazy circuit schools in the Mpumalanga Province was explored from different sources, ranging from primary to secondary sources. For instance, information was gathered from a variety of sources such as recent journals and articles, textbooks, newspapers, etcetera. Both local and international sources were used in this study. A literature study, according to De Vos (1998:64), contributes towards a clear understanding of the nature and meaning of the problem that has been identified. Therefore, a literature study or a theoretical framework is vital for guiding research. It ensures coherence and establishes the boundaries of the projects (Bank 2004:17).

### **1.6.3 Population and sampling**

McMillan and Schumacher (2014:64) define the population of a study as “a group of elements or cases, whether individuals, objects or events, that conform to specific criteria and on which the researcher intends to generalise the results of the research”. In my study, the population refers to all 28 primary schools in the White-Hazy Circuit in Mpumalanga, South Africa.

According to De Vos, Fouche and Schurink (2011), the study sample is an effort to understand the population from which it was drawn. I selected five primary schools purposefully out of 28 primary schools to form the sample of my study. Three of the five rural primary schools offer mathematics in the foundation phase in siSwati, and in the intermediate phase in English Additional Language (FAL). The other two rural primary schools offer all mathematical instruction in English, in both of the foundation

and the intermediate phase. I selected the five schools purposefully because they meet the following criteria:

- The school should have been in existence for no less than ten years.
- The school has a consistent record of reaching the set circuit target of 75% or more in mathematics results.
- The schools are within a radius of 20 kilometres from where the researcher works.

The sample for my study comprised fifteen (15) participants. I interviewed five principals, five deputy principals and five Grade 6 mathematics teachers from the five selected schools.

#### **1.6.4 Instrumentation and data collection techniques**

##### *1.6.4.1 Literature review*

Through the literature research, my study established the difficulties that school principals face in the management of the poor mathematics results of intermediate phase learners at primary schools. The literature research was also instrumental in the formulation of the semi-structured interview questionnaire that was used during the empirical investigation. I studied relevant books and journals with a view to inform and direct the investigation of my study.

##### *1.6.4.2 Interviews*

I conducted interviews as a data collection method. "An interview is a two-way conversation in which the interviewer asks the participants questions to collect data and to learn about the ideas, beliefs, views, opinions and behaviours of the participants." (Maree, 2010: 87) I used semi-structured interviews, which were video recorded online using Microsoft Teams, due to the Covid-19 pandemic, and later transcribed. Due to the impact of Covid-19, I was not allowed to conduct face-to-face interviews. These interviews gave me the chance to discuss issues on how to improve the poor mathematics results of intermediate phase learners at primary schools and established the difficulties that school principals face in the management of mathematics results. Fortunately, the use of computer online tools has some advantages. Howard (2019) highlights some of the advantages:

- Increased response rate and flexibility.
- Respondents get to answer questions according to their own schedule at a pace they choose. Surveys can be programmed even if they are very complex. The researcher can create the layout questions and answer choices with no hassle.
- Low cost.
- Collecting data does not have to be expensive. There are plenty of websites and platforms that make creating surveys fast and affordable.
- Real-time access.
- Respondents' answers are stored automatically, so the researcher gets results at his fingertips in no time. This turns analysing results into effortless and immediate action.

I used the semi-structured interviews to follow up on statements made and issues raised during the interviews in an effort to enhance clarity. The semi-structured interviews were conducted with the five primary school principals, five deputy principals and five Grade 6 mathematics teachers selected to participate in my study.

In-depth and semi-structured individual interviews were used to collect data from the participants. Online interviews are especially useful for understanding the meanings participants assign to their activities; their perspectives, motives, experience, and gathering information about processes that cannot be observed, or inquiry about the past, Lindlof & Taylor, (2002). One of the advantages of one-on-one interviews is that it is far easier to transcribe a recorded interview when the talk involves just one interviewee. The aim of conducting individual interviews is to determine stakeholders' perceptions towards the role of principals and teachers in improving the Grade 6 learners' performance in mathematics in Mpumalanga. Therefore, structured open-ended questions were used to determine these perceptions and they are based on the literature review.

Interviews are most appropriate for asking questions that cannot be structured effectively in a multiple-choice format (Lindlof & Taylor 2002). These structured, self-administered questions are also flexible, since interviewers can adapt the situation to each subject. The reason why interviews were employed as a method to collect data is that in many results they provide more accurate and honest responses, since the

interviewer can explain and clarify both the purpose of the research and individual questions.

Field notes were also used to assist the researcher in capturing the discussion that takes place during the interview, since human memory only is unreliable as a search instrument and it is criticised as being prone to partial recall bias and error (Denscombe 2007:194). Field notes also help interviewees, as they can refer to it at various later stages to refresh the memory. Field notes were taken during the interview itself, but if that was not feasible, as soon afterwards as possible. Field notes need to be made while events are fresh in the mind of the interviewer. Interviews were also video recorded online to back up written field notes, but permission was first asked from the interviewee to video record an interview. The letter for this purpose was attached as an appendix at the end of this report (Annexure D).

#### *1.6.4.3 Document analysis*

I also analysed different documents in my study. Cohen, Manion and Morrison (2011) briefly define a document as “a record of an event or process”. Such records may be produced by individuals or groups, and take many forms. For my study, selected school documents from the five participating schools were analysed. I analysed documents such as the school assessment policies, school improvement plan (SIP), minutes from the mathematics committee, minutes of the school management team on analysis of results, the staff minutes on analysis of results, teacher development reports, curriculum implementers’ reports, curriculum researchers’ reports like the National Educational Evaluation and Development Unity (NEEDU), and school academic results for the past five years. The documents analysed showed a consistency of performance, the effectiveness of the leadership styles of the principals, and the effective hard work of teachers. The document analysed provided the researcher with a clear picture of the schools under study. The schools are led by instructional principals who know exactly what their roles are in influencing their schools’ results. Therefore, official documents were used to support the semi-structured interviews and improve the trustworthiness of the findings. The documents revealed aspects that were not found through the semi-structured interviews. Cohen *et al.* (2011) state that documents are useful in rendering more visible the phenomena under study, also affirm this view.

### **1.6.5 Data analysis and interpretation**

After the data had been gathered from the participants, the process of analysis and interpretation followed. Data analysis concerns the breaking up of data into logical and manageable themes, categories, patterns, trends or relationships. It also involves collecting open-ended data based on asking general questions and developing an analysis from the information supplied by the participant (Creswell 2009:184).

The data were analysed using content data analysis. This approach, according to Denscombe (2007:99), involves coding and categorising the raw data. It is also linked with qualitative research, which focuses on small-scale studies and research focusing on human interactions in specific settings. Data interpretation happened next, having to do with the synthesis of data with a view to reach meaningful conclusions (Mouton 2001:109).

The process of analysing and interpreting data, according to Denscombe (2007:292), involves a series of four tasks. That is coding, categorising, identification of the themes and the generalisation of conclusions based on the patterns and themes that have been identified. Firstly, the researcher coded the data. For instance, codes take the form of alphabets, names, initials or numbers. Secondly, the researcher identified ways in which codes can be grouped into categories. The categories act as an umbrella term under which a number of individual codes can be placed. This means that the components of data were classified under key headings. This was followed by the indication of themes and relationships among the codes and categories.

Finally, the researcher developed concepts and arrived at some generalized conclusions based on the relationships. Patterns and themes were identified in the data. Conclusions and recommendations for further study will be reported in the last chapter of this study.

## **1.7 CREDIBILITY AND TRUSTWORTHINESS**

In this study, the following strategies were used to ensure credibility and trustworthiness:

- Triangulation of methods: Interviews with SMT members (principals and deputy principals), and the teaching staff (Grade 6 mathematics teachers). Relevant

school documents such as circulars and minutes of meetings (SMT and mathematics committee on teacher development), assessment programmes, mathematics committee programmes and summaries of five years' academic were analysed at great depth.

- Mechanically recorded data: All interviews were video-recorded online using Microsoft Teams and transcribed later verbatim.
- Verbatim accounts: Direct quotations from the transcribed data were used to illustrate the participants' views.
- Participants' language: Interviews were conducted in English, the medium of instruction at all the schools selected for the study, but the participants were also free to use any languages of their choice that both the researcher and the interviewee understood.
- Field research: The research was conducted at the schools or places of the interviewee's choice in the natural location of the participants, because it took place online.
- Low inference description: Concrete and precise descriptions from the interviews, and the analysis of the relevant school documents such as School Developmental Programmes(SDP) and School Improvement Plan (SIP) were used in the research findings.
- Reliability: Appropriate research tools were used to maintain consistency. For instance, the researcher ensured that the selected tools measure what they are supposed to measure. This could be achieved by coding the raw data in the way that others come in similar themes and conclusions.
- Validity: It was achieved by spending sufficient time with subjects online, namely persistent examination of the relevant school documents and triangulation methods were used, for instance, multiple sources of data such as written records such as the minutes of meetings, SDP and SIP.
- Trustworthiness: The researcher selected trustworthy evidence for pattern seeking. For instance, similar themes, categories, patterns and trends were grouped together for detailed analysis.

## **1.8 RESEARCH ETHICS**

The researcher took measurable considerations to ensure that research ethics was complied with in the following manner:

### **1.8.1 Permission to conduct research**

After a researcher has determined what permissions are required, he/she has to approach the organisation and ask for permission. If the organisation has a policy about research activities, then the researcher must read the policy and determine the appropriate process to gain access to the people and data. (Benjumea 2014). For this study, I applied for permission to the White-Hazy circuit manager and the principals of the five selected schools in the White-Hazy circuit for permission to conduct research.

### **1.8.2 Ensuring informed consent**

Informed consent is an ethical and legal requirement for research involving human participants. It is the process where a participant is informed about all aspects of the research, which are important for the participant to make a decision (Nijhawan 2013). The purpose of the study explains the aims and objectives, which have to be discussed with the participants. Written information has to be given to the participants prior to data collection and the participants have to agree to participate in the study. For this study, the purpose and procedures were explained clearly on the consent forms. The participants signed and consented to participate. Where they needed clarity, they were informed.

### **1.8.3 Confidentiality**

The participants in this study were well informed and assured that the information gathered was for study purposes only, and would never be disclosed to anybody or authority outside the study. They were also asked to treat the information with confidentiality. McMillan and Schumacher (2014:362) affirm that credible research design involves not only selecting participants and informing them of necessary content but also adhering to research ethics.

### **1.8.4 Anonymity**

The participants and the schools involved in this study were coded and given pseudonyms so that they could not be identified easily, which is a requirement

stipulated by the code of ethics. Schools were named as Schools A to E, principals (A1, B1, C1, D1, E1), deputy principals (A2, B2, C2, D2, E2), and Grade 6 mathematics teachers (A3, B3, C3, D3, E3).

### **1.8.5 Protection of human rights and dignity**

A researcher must ensure that conducting his or her research does not violate human rights. In this study, human rights, as stipulated in the Constitution of South Africa (1996), under the Bill of Rights were considered and protected when interacting with participants. An example of rights considered are the right to privacy, freedom to withdraw, the right not to be harmed in any manner, and many more.

## **1.9 LIMITATIONS AND DELIMITATIONS OF THE STUDY**

The project on the role of principals in improving Grade 6 learners' performance in mathematics in Mpumalanga would be proper and beneficiary, if conducted in the whole of Mpumalanga region. However time, finances and the outbreak of the Covid-19 pandemic made this research limited to only five schools in the White-Hazy circuit, and changed the data collection method, which excluded the 'observation' method, and was limited to online interviews and document analysis only.

According to Gwija (2016:17), delimitations in a study are those characteristics that limit the scope and define boundaries of a researcher's study. Therefore, the delimitation of the study was the population size and the number of participants. The researcher addressed this delimitation by collecting information about a number of primary schools in the White-Hazy circuit, which provided an accurate picture of these schools. There are more primary schools in the White-Hazy circuit. The five selected schools under study would assume that the research results might be similar to what happens at other schools within the circuit.

## **1.10 DEFINITION OF KEY CONCEPTS**

### **1.10.1 School improvement**

School improvement means linking the school's internal structures, strategies, capacities and processes in a coherent manner to advance a specific goal. School improvement includes finding ways to strengthen the management and leadership



capacities of those working at schools to ensure that learners are provided with learning opportunities of high quality (Marishane & Botha 2011:1). In this study I wanted to determine which strategies principals and teachers could implement to improve the poor mathematics results of intermediate learners at primary schools.

### **1.10.2 School leadership**

*School leadership* is the process of enlisting and guiding the talents and energies of teachers, pupils and parents towards achieving common educational aims (Waters & Marzano 2006). According to Marishane and Botha (2011), school leadership is letting the right people do the right things. In my study I want to explore which strategies school leadership can use to support teachers to improve the poor mathematics results of intermediate learners at primary rural schools.

### **1.10.3 Mathematics**

Mathematics is a language that makes use of symbols for describing numerical, geometric and graphical relationships; a human activity that involves observing, representing and investigating patterns and qualitative relationships in physical and social phenomena and between mathematical objectives themselves. It helps to develop mental processes that enhance logical and critical thinking, accuracy and problem solving that will contribute towards decision-making (CAPS foundation phase mathematics, Grades R-3:6). My aim was also to monitor the planning of teachers and identify whether teachers are using the correct concepts in their lessons.

### **1.10.4 Intermediate phase**

According to the South African *Dictionary* (2013), the intermediate level is a stage or level that occurs between two other stages or levels. It further defines the intermediate phase as Grades 4, 5 and 6. (South Africa). In the Mpumalanga Department of Education, the intermediate phase encompasses Grades 4 to 6. My study focused on the poor intermediate phase mathematics performance and the role of school principals to improve the poor mathematics results in the intermediate phase of primary rural schools.

## **1.11 PLANNING OF THE STUDY**

This section concerns a brief outline of what is covered in each chapter.

Chapter 1 introduced the study. It encompassed a brief historical synopsis of the existing problem, the problem statement, and the aims of the study and the methodology to be used. It provided an outline regarding the motivation to conduct the study, contributions of the study and definitions of concepts.

Chapter 2 focuses on the literature review, which includes relevant information on the roles of school principals to improve the poor mathematics results of intermediate phase learners at primary rural schools. The literature review identified the characteristics of effective school principals and explained the challenges and needs of school principals to improve the poor mathematics results of intermediate phase learners at primary rural schools.

In Chapter 3, the research design is described and the research methods explained. This chapter provides a description of the population, procedures and description of the tools and its application.

In Chapter 4, the data collected are presented and analysed.

Chapter 5, the final chapter, focuses on an interpretation of the findings and makes recommendations. Suggestions for further research are also included in the last chapter.

## **1.12 CONCLUSION**

Chapter 1 introduced the research and the research aims were clearly stated to indicate what the research intended to attain. The method of the study was indicated to demonstrate the focus area of the research. The issue of ethics is very important to every research and was therefore discussed. Significant concepts that form the cornerstone of the research study were clarified. Research findings or outcomes may assist all stakeholders in education, especially mathematics planners and principals to change the present poor results in the intermediate phase at primary rural schools. The recommendations of my study at the five primary rural schools in the Mpumalanga

Province might improve the poor performance in mathematics in the intermediate phase at primary schools.

In the following chapter, Chapter 2, a review of the relevant available literature – with reference to poor mathematics results – is presented in a comprehensive discussion of the managerial role of principals and mathematics teachers' strategies in improving learners' mathematics results at Mpumalanga primary schools, using the White-Hazy Circuit as a case study. The relevant sources include school principals, deputy principals Grade 6 mathematics teachers, selected school documents (assessment programmes, minutes of SMT and staff and the mathematics committee on the analysis of results, summary of results, CAPS documents), research articles, report papers, theses and newspapers.

# **CHAPTER TWO: LITERATURE REVIEW**

## **2.1 INTRODUCTION**

This chapter will focus on the review of literature on factors that influence learner performance in examinations at primary schools. It begins with an explanation of the concept 'performance' in the context of this study. This will be followed by an overview of Grade 6 learner performance at national level and in the White-Hazy Circuit between 2014 and 2018. The review continues with a brief historical perspective on South African education which provides a background to the present situation. Factors influencing learner performance such as home background, location and school culture will be discussed. This will be followed by learner-related factors such as learner discipline, learner motivation, study skills and parental involvement.

Other factors from outside the school will be discussed. Factors including economic background, social challenges such as family relationships, teenage pregnancy, and health hazards are discussed. Teacher factors that can affect learner performance will also be discussed; these include continuing professional development, academic qualifications, classroom management, teacher absenteeism, knowledge of the subject, lack of teacher motivation, the lack of resources and the development of technology.

The leadership role of School Management Teams (SMTs) in managing learner performance is then discussed. The leadership styles of managers will also be discussed, which include bureaucratic, transformational, distributed or shared, autocratic, laissez faire attitudes and democratic leadership styles. The discussion will also unpack organisational approaches such as human relations and a classical approach. Systems approaches are also discussed. A theoretical framework underpinning the study will be discussed at the end of this chapter.

Table 2.1 below presents the national pass percentages in Mathematics and Home Languages:

Table 2.1: 2012 Mean ANA percentages by district, province and national profile(NEEDU Report 2013)

Grades	Grade 3	Grade 3	Grade 6	Grade 6
District	Mathematics	Home Language	Mathematics	Home Language
Bohlabela	35,2	46,9	19,7	23,5
<b>Ehlanzeni</b>	37,1	48,7	<b>25,0</b>	38,8
Gert Sibande	36,3	47,5	24,2	32,3
Nkangala	32,8	48,9	24,1	39,6
Province	35,6	48,0	<b>23,4</b>	33,4
National	41,2	52,0	<b>26,7</b>	42,8

Table 2.1. Demonstrates the poor Grade 3 and 6 ANA results (showing Mathematics and Home language) in the districts in Mpumalanga province.

Table 2.1: Mpumalanga White-Hazy circuit pass percentage from 2014 to 2018

Year	2014	2015	2016	2017	2018
Circuit pass%	58	61	53	59	55

Source: White-Hazy1 circuit results 2014–2018

The five-year circuit results demonstrate that the circuit has generally been underachieving in mathematics. The White-Hazy circuit target in all subjects is 75%. The results show that the circuit has never reached its target in mathematics. The circuit performance trend reveals that it is performing at 50%. Motsepe (2017) points out that the primary mathematics results need drastic improvement and is in crisis in primary rural schools in South Africa. The trend in the White-Hazy circuit indicates that the Grade 6 learners perform 20% below the set target of the circuit, which is 75%. Therefore, primary school principals have to work hard to improve the performance of primary school learners.

## 2.2 THE CONCEPT OF PERFORMANCE

Performance is related to effectiveness and efficiency. Effectiveness as an indicator of the degree of a goal attainment, and efficiency as an indicator of the resources that were consumed to reach the level of achievement. It is also described as the level or degree of achievement of an organization or department rather than that of an individual (Semma, 2016).

In short, it means getting best results on a given task or activity. In the South African education system, a primary school is deemed to have performed well if its overall pass percentage in an examination is above 75%. A short description will be given in the next section on the current status of education in South Africa.

### **2.3 THE CURRENT STATUS OF EDUCATION IN SOUTH AFRICA**

South Africa is faced with many crises in education. Despite the government systems of improvement which include the budget increment, improvement of SGBs' functionality, improvement of safety policies and change of curriculum, the results are still deteriorating. Much has been written about South African performance crisis. Modisaotsile (2012:2), for example, points out the following:

The results of 2007 had shown some improvement in reading since 2005, but not in mathematics. Many of our learners lack proper foundations in literacy and numeracy and so they struggle to progress in the system and into post-school education and training. Quality of schooling is sub-standard, especially in the township schools. Learner achievement in Grades 4–6 and 9, particularly in mathematics, showed wide-ranging deficiencies in basic knowledge and competencies. Other issues surrounding the status of education in South Africa include violence at schools, lack of parental involvement, teacher challenges (absenteeism, lack of mathematics knowledge, substance abuse, learner pregnancy, lack of resources, overcrowding, and lack of discipline”.

It is clear from the above that South African schools are in a crisis and schools in rural areas are performing below standard. The researcher will discuss the administrative management theory to support principals as the theoretical framework in the next section.

### **2.4 THEORETICAL FRAMEWORK**

Leadership styles of principals such as bureaucratic, democratic or distributed, transformational and autocratic will be discussed to match the best leadership style that can promote the improvement of mathematics performance. The researcher will discuss Fayol's administrative management theory by Fayol, cited in Akrani (2011) as the theoretical framework for my study.

### 2.4.1 Administrative management theory

Administrative management theory is a classical management theory developed by Henry Fayol in 1916, Akrani (2011). The theory encompasses business management as well as general management. It is also applicable to schools, as the researcher will illustrate below. It has six functions and fourteen principles, as illustrated below. The six functions of the administrative management theory will be discussed in Table 2.3.

Table 2 2: Functions of the Administrative Management Theory (Akrani 2011)

Functions of Administrative Management Theory	
Administrative function	Application in practice
Forecasting	“Forecasting is a technique that uses historical data as inputs to make informed estimates that are predictive in determining the direction of future trends. Business utilise forecasting to determine how to allocate their budgets or plan to anticipate expenses for an upcoming period of time. This is typically based on the projected demand for the goods and services offered.” (Tuovila 2020 ) Schools struggling with poor Grade 6 mathematics results implement a turnaround strategy based on the data and results available has to improve over a planned period.
Planning	“Planning is the process of deciding in detail how to do something before you actually start to do it.” (Collins English Dictionary, 2013) The planning function of management controls all the planning that allows an organisation to run smoothly. After the analysis of grade results, the SMT (School Management Team) and teachers has to develop a plan on how to improve the results before the following year begins.
Organizing	“Organizing is the process of identifying and grouping the work to be performed, defining and delegating responsibility and authority, establishing relationships for the purpose of enabling people to work effectively together in accomplishing objectives.” (Allen 2013) The delegated duties in the school organogram work together in achieving the goals of the institution, which in this case will be the improvement of mathematics results.
Commanding	“Commanding is having the authority to give orders.” (Cambridge English Dictionary 2013) The overall authority in the school rests with the principal. Nevertheless. other levels in the school hierarchy possess distributed decision-making powers in areas where they are given responsibility. The HODs have authority over teachers in his or her department, while teachers have some authority as class managers.
Coordinating	“Coordinating is the process of organizing people or groups so that they work together properly and well.” (Cambridge English Dictionary 2013) The SMT (School Management Team) is responsible for coordinating the functioning of a school. They must ensure that all teachers are allocated properly and are able to work together to ensure teaching and learning. Other stakeholders at the school are also expected to work together in achieving the school goals.
Monitoring	“Monitoring is the systematic process of collecting, analysing and using information to track a programme’s progress towards reaching its objectives and to guide management’s decisions.” (Virtual Knowledge, UN Women 2010) The principal monitors the work of the deputy principal; the deputy principal monitors the work of the heads of departments; and the Heads of Departments monitor the work of teachers. The school also needs to implement the Integrated Quality Management System (IQMS), which ensures quality and performance for every teacher. The Curriculum Implementers (District level) also visit the school regularly for quality control and the implementation of policies to improve results.

If the administrative functions of management are followed and implemented by school principals and management teams at White-Hazy schools, the Grade 6 results in mathematics might improve. The researcher will discuss the principles of management in the next table.

## 2.4.2 Principles of management

In the previous section, the researcher discussed the administrative management theory. In this section an explanation will be given of the 14 principles of management as identified by Fayol (cited in Akrani 2011). This is discussed in Table 2.4.

Table 2 3: Principles of management (Fayol, in Akrani, 2011)

Principles of management	Application in practice
Division of work	“Division of work means to divide, chop or break it up into smaller parts to facilitate a better understanding, easier handling and operation, and focussed observation on a fixed set of goals.” (Cambridge English Dictionary 2013) Fayol believes the division of work is important at managerial level in an organisation for smooth operation and helps to make workers more effective and efficient, Akrani (2016). At primary schools, heads of departments are trained as phase specialists, namely, the foundation phase, intermediate phase and part of the senior phase (Grade 7) (Stringer 2013).
Authority	“Authority is the power to determine, adjudicate, or otherwise settle issues or disputes, jurisdiction, the right to control, command or determine’. Akrani (2011). Fayol’s principle of authority states that as the supervisor gives commands and makes decisions, he or she must also take responsibility. Authority without responsibility will lead to a waste of position and lack of utilisation of power. Responsibility without power will lead to poor utilisation of human and other resources. The SMT has authority over those they manage, but in turn they have the responsibility to utilise the human resources and other resources effectively (National Education Policy Act 27 of 1996).
Discipline	“Discipline is the practice of training people to obey rules or code of behaviour using punishment to correct disobedience.” (Cambridge English Dictionary 2013) Fayol confirms that an employee should be obedient and respectful towards the authority and the established rules and regulations of the organisation. Clarity of rules, a reward-punishment system, good supervision, etc., are some ways to maintain discipline, but it depends on the policies and the needs of the organisation on how to maintain discipline. Teachers are charged with misconduct and might face expulsion if they fail to comply with the Department’s code of professional ethics administered by SACE (South African Council for Educators).
Unity of command	“Unity of command provides that an employee is responsible to only one supervisor, which goes up to the organizational hierarchy. This is true even if the organization is led by a group of people.” (Collins Dictionary 2013) Fayol emphasised that an employee must receive orders from one immediate supervisor only. The employee should be accountable to the immediate supervisor only. At school level, the principal is the only supervisor responsible for issuing orders. If he delegates his or her deputy, the orders should not be in conflict with one another (ELRC document).



Unity of direction	Unity of direction can lead to all the members of the organisation towards its objectives (Akrani 2011) In this principle Fayol suggests that in one department or section, the division should only get instructions from one head. Akrani (2011) At a school, the principal is the one who gives instruction, while departmental heads give instruction to teachers, and class teachers give instructions to their learners in class (ELRC and school policy).
Subordination of Individual Interests to the General Interests	“Subordination is the act of giving something or someone less importance or power.” ( <i>Cambridge English Dictionary</i> 2013) Fayol states that there are two types of interests; that of the individual and of the organisation. He suggests that there must be harmony between these two interests. Organisational interests must be given more priority, as doing well for the organisation will bring rewards for the individual, Akrani (2011). Teachers are expected to work beyond their scope of work, doing preparations after school, participating in extra-mural activities, attend workshops and meetings and attending extra mural activities and SGB meetings on weekends (school policy).
Remuneration	“Remuneration is payment or compensation received for services or employment. This includes base salary and any bonuses or other economic benefits that an employee or executive receives during employment.” Akrani (2011). Fayol focuses more on non-monetary remuneration, which he believes will create bonding between the employee and the organisation. Therefore, the remuneration must be fair, reasonable and satisfactory, Akrani (2011). The salaries are based on REQV (Relative Education Qualification Value) and post levels (1, 2, 3, 4, etc.) ( <i>Employment of Educators Act 76 of 1998</i> ).
Centralization	“Centralization is the action or process of bringing activities together in one place.” ( <i>Oxford Dictionary</i> 2010) Fayol’s principle implies that “the topmost level of authority should be centralised to the top level of management. There should be the delegation of power to the subordinate but the power to make the important decision in the organization should remain with the top level management. Akrani (2011) Teachers and heads of departments can make recommendations to the top level management, but the final decision remains with the principal as the accounting officer (ELRC, SACE, and School Policy).
Scalar Chain	“Scalar chain is the formal line of authority which moves from highest to lowest rank in a straight line. It specifies the route through which the information is to be communicated to the desired location or person.” Akrani (2011). Fayol points out that “there should be a chain of supervisors ranging from the top level of management to the lower level of management based on the hierarchy level. The communication flows from the top to the bottom through this chain of authority, however there is no hard and fast rule regarding the process of communication through the scalar chain.” Akrani (2011). At school level the principal has the most authority. The principal is followed by the deputy, the HODs and then teachers in terms of authority. However, communication can also flow from the bottom up, but needs to be refined by the principal (ELRC, SACE and School Policy).
Order	“Order is an authoritative direction or instruction, command, mandate.” (Dictionary.com 2019) Fayol’s principle states that “every material and manpower should be given a proper place in the organization. The right man for the right job is essential in the smooth running of an organization. So, management must identify tasks and put them in proper order with the limited human and other resources.” Akrani (2011). All learning and teaching support material should be at the school before the commencement of the school year. School programmes should be in place, admissions

	should be completed and learners should be placed in class registers for the commencement of the school year. Teachers are expected to be at their workstations seven hours per day five days a week during the school term ( <i>Employment of Educators Act 76 of 1998; School Policies</i> ).
Equity	“Equity is a combination of kindness and justice. Equity creates loyalty and devotion in the employees.’Akrani, (2011). Fayol contends that all the members of the organisation should be treated equally. The Constitution of the Republic of South Africa prescribes that all people are equal before the law and should be treated as such (Constitution 1996).
Stability of Tenure of Personnel	“Stability of tenure states that in order for an organization to run smoothly, personnel (especially managerial personnel) must not frequently enter and exit the organization’ (Akrani, (2011).Fayol indicates that “employees can work to the fullest if they have secured a secured job. So employees must be provided with job security which will help them to be efficient. This will also benefit the organization as it lowers the labour turn over and reduces the cost of recruiting and training new employees” Akrani (2011). In most cases teachers are employed permanently according to the requirements of REQV 13. Principals are permanently placed at their institutions; only post level 1 teachers may be deployed if there is a need ( <i>Employment of Educator’s Act 76 of 1998</i> ).
Initiative	“Initiative is a new plan or process to achieve something or solve a problem.” ( <i>Cambridge English Dictionary</i> 2019) Fayol states that “an initiative is the level of freedom that an organization should provide to the employee to carry out the plans without forcing them or ordering them. This is related to the creation of interest and willingness in the employees by motivating and satisfying the employees” ( <a href="https://kalya.city.blogspot.com">https://kalya.city.blogspot.com</a> 2016). Any stakeholder at the school is allowed to initiate anything through relevant committees that will assist the school effective in achieving its goals (School Policies).
Esprit de Corps	“Esprit de corps is the common spirit existing in the members of the group and inspiring enthusiasm, devotion, and strong regard for the owner of the group.” (Webster 2019) This principle of Fayol implies that “union is strength” and team spirit. So, the organisation must integrate all its actions towards a single goal and objective Akrani (2011). Principals and SMTs should encourage team spirit and good relationships among staff members as this will increase willingness to work and towards good school results. At our school, for example, we have year-end parties; we also celebrate members’ birthdays and we support members when they are bereaved with contributions and physical support.

Administrative management theory is a relevant theory that makes school functioning harmonious, orderly and every member clearly taking responsibility and accountability without pressure, each one realising the need for the responsibility and accountabilities. I want to make the assumption that this theory might support principals to improve the mathematics results of Grade 6 learners at rural primary schools. Principals need also to be good leaders. In the next section I will discuss different types of leadership styles.

## **2.5 LEADERSHIP STYLES OF PRINCIPALS**

Principals need to be good leaders and need to lead their school to achieve good results. “Leadership is the capacity to translate vision into reality.” (Bennis 2013)

### **2.5.1 Bureaucratic leadership style**

Bureaucratic leadership style is leadership based upon fixed official duties under a hierarchy of authority, applying a system of rules for management and decision-making (Martin 2017). This style of leadership can be advantageous in highly regulated types of business, and it can be an efficient management style in companies that do not require much creativity or innovation from employees (Martin 2017).

A principal as a bureaucratic leader will be using rigid rules at a school, will not accept views from other people. The principal will also use stiff division of labour and responsibilities. Decisions are taken in a strict and often in a top-down order. The learners, teachers, HODs and SGB will be receiving orders from the principal only without any sharing of opinions,

The advantages (Lee, 2020)

- Stable in terms of job security and outcomes.
- Removes favouritism from the equation.
- Very clear roles, responsibilities and expectations.

Disadvantages (Lee, 2020)

- Not efficient, since everything has to go through a chain of command.
- Does not encourage an individuals’ personal growth.
- Stifles creativity, innovation, and free thinking.
- Doesn’t foster collaboration or relationship building within teams.
- Can make it difficult to respond to change.

### **2.5.2 Democratic leadership style**

Democratic leadership, which is commonly known as participative leadership, is about letting multiple people participate in the decision-making process. This type

of leadership can be seen in a wide range of contexts, from businesses to schools to governments. (Lee S., 2020)

Democratic leadership has the following advantages:

- Strong teams where team members tend to be supportive and strong, honest, collective work is done, because everyone's opinion is taken into consideration (Balyer 2017).
- Democratic leaders are typically excellent at solving complex issues. They have the ability to work collaboratively, using consensus of opinions to get things done the right way. They often think creatively and encourage others to do the same (Bourne 2018).
- Democratic leadership 'invites higher levels of commitment', and when used correctly, democratic leadership can foster positive and healthy company cultures.(Wilson, 2019).

On the other hand, democratic leadership also has some disadvantages:

- In situations where roles are unclear or time is of the essence, democratic leadership can lead to communication failures and incomplete projects (Miller 2017).
- In some cases, group members may not have the necessary knowledge or expertise to make quality contributions to the decision-making process (Miller 2017).

Democratic leaders might implement new initiatives by following strategies such as:

- All communication must be open and honest. It is crucial for the leader to receive in and give fair criticism it without causing a problem. The leader must establish trust with subordinates and show consistency and fairness in his or her decisions (Tyler 2016).
- Respect for all ideas. As a leader, you should reject an idea only because it is not relevant for the moment. You do not want to spend too much time talking about issues that are not relevant, but you also do not want to dismiss suggestions straight away (Meador 2018).
- The democratic framework works the best when roles and responsibilities are

outlined clearly. One of the key reasons behind clarified processes is to ensure people to stay on-topic. The leader must ensure the conversation stays within the framework and the discussion flows towards a solution for the problem at hand (Wolf 2015).

### **The principal as a democratic leader**

- The principal work with all stakeholders as a team. The SMT, SGB and teachers' opinion is taken into consideration. The democratic principal often thinks creatively and encourage others to do the same, working collaboratively, using consensus of opinions to get things done the right way. They invite higher levels of commitments, and when used correctly, can foster positive and healthy school cultures.

### **2.5.3 Transformational leadership style**

Transformational leadership inspires people to achieve unexpected or remarkable results and gives workers autonomy over specific jobs, as well as the authority to make decisions once they have been trained (St. Thomas University 2018)

Basic characteristics of transformational leaders:

- The leader can inspire workers to find better ways of achieving a goal (Folkman 2017).
- The leader can mobilise people into groups that can get work done (Henley 2019).
- Leaders raise the well-being and motivation level of a group through excellent rapport and are also good at conflict resolution (Physio.org).
- They are sometimes called quiet leaders. They are the ones that lead by example. Their style tends to use rapport, inspiration, or empathy to engage followers (Crockett 2018).
- The transformational leader motivates workers and understands how to form them into integral units that work well with others (Comaford 2018).
- The principals' role as a transformational leader:
- The transformational principal creates a clear vision based on identified needs. All members and stakeholders at the school will know it. The principal will guide

his or her teams which could be the SMT, SGB, Teachers and learners towards achieving that unified goal, which could be performance. These, the principal may do through inspiration and motivation. (Lee, S 2020 )

#### **2.5.4 Instructional leadership**

Instructional leadership is building a vision, establishing a shared leadership model, leading and using data, and monitoring curriculum and instruction. The most effective teachers seem less instructional strategies during a lesson and good principals can identify them. (Sheninger 2016:2)

Currently, there is a need in the White-Hazy circuit for principals who are instructional leaders and who are capable of improving mathematic performance. Principals who can provide a vision to teachers and learners so that they can work together to accomplish it, name to improve mathematics results. Marzano (2017) confirms that setting and sharing a clear, school-wide direction gives a principal and his or her colleagues a sense of purpose and identity. It gives the entire school a way to measure and monitor daily routines and to prioritise activities that contribute directly to furthering the school's direction, goals and vision.

The role of a principal as an instructional leader:

An instructional principal will build a vision for the school and communicate it to all stakeholders, so that everyone will be working towards achieving its goal. The principal will share leadership with all stakeholders, SMT, SGB, teachers and learners. Data will be used at this school to analyse and improve performance in curriculum and the school wellness. The principal will monitor curriculum and instruction, and will support and develop teachers who are not performing accordingly. (Indeed Editorial Team, 2021)

Advantages of instructional leadership:(Indeed Editorial Team, 2022)

- Have a clear vision for the school.
- Recognize individual strengths.
- Maintain communication with stakeholders.
- Encourage continued learning.

- A leader is a role model.

Disadvantages of instructional leadership:

- Vague conceptualization of the instructional role.
- Feelings of inadequacy related to curriculum and expertise.
- Work intensification.
- Time constraints.

### **2.5.5 Autocratic leadership style**

Penn (2017) explains that the autocratic leadership style is used when employees are not capable of doing the job at hand on their own and need strong support and guidance to complete the task. The autocratic leader will make all decisions, direct subordinates and expect obedience without questioning (Penn 2017). No initiatives or suggestions are used in the decision-making process. This authoritarian style is effective when there is a tight deadline or if many are people involved in the project (Penn 2017). The autocratic leader will set standards and tell employees what needs to be done, how to do it, and when it must be finished (Shaeffer 2018).

The principals' role as an autocratic leader:

The principal will be making decisions on his or her own without consulting school stakeholders like the SMT, SGB, Unions, teachers or the rest of the school community, even if it was necessary to do so, and they are just expected to follow. The principal will make policies and procedures without collecting input from team members (Lee, 2020)

Advantages of Autocratic leadership (Lee, 2020)

- Can be efficient, especially when it comes to decision-making.
- It keeps teams cohesive and consistent, since one person is taking charge.
- May make everyone's' individual roles clear since they will be delegated specific duties and won't be encouraged to step outside of that role.

Disadvantages of an Autocratic leadership (Lee, 2020)

- Can stifle creativity, collaboration and innovation.

- Does not lead to diversity in thought.
- May lead to disengaged individuals and teams who feel like they do not have a voice.
- Does not allow any room for mentorship or professional growth.

### **2.5.6 Distributed leadership**

Distributed leadership is about giving leaders in schools ownership by empowering them to lead their teams and drive forward their strategies that contribute towards the whole school priorities” (Solly, 2018). The principal will give ownership to different leaders, including SMT members, different committee members SGB members and learner leaders. The principal will empower them on how to use their different strategies to contribute towards the whole school priorities (Solly, 2018).

Advantages of distributed leadership (Carrol, 2021)

- Focuses on customer and market.
- Drives innovation and satisfaction.
- Reduces corporate exposure.
- Discovers and cultivates leaders.
- Improves communication.

Disadvantages of Distributed leadership (Miller, 2022)

- It can be a struggle to maintain accountability.
- It slows down the decision-making process.
- It creates an expectation of importance.
- It generates a certain level of uncertainty.
- It requires leaders to have specific experience.
- It can foster arguments.

## **2.6 FACTORS INFLUENCING LEARNER PERFORMANCE IN MATHEMATICS**

Nkosi (2012) explains that rural South African schools are the weakest in the international assessment performance and results from Trends in International Mathematics and Science Study (TIMSS). It also shows that pupils at rural public



schools perform worse than their urban counterparts in languages, mathematics and sciences. The researcher, next discusses factors that might influence learner performance in mathematics.

### **2.6.1 Lack of proper basic skills**

Poor mathematics performance is caused by many factors, including lack of proper basic skills and knowledge among teachers and learners. Paton (2011:1) confirms that official figures show that more than a quarter of mathematics teachers do not hold a relevant degree or postgraduate qualification in mathematics, "It is the case with primary schools because teachers in primary schools are trained as generalists, and they do not specialize in any subject."

As the study is focused on primary schools and Grade 6 mathematics performance, this proves that teachers teaching Grade 6 or primary school lack the proper basic mathematics skills and knowledge, which is a major challenge contributing to South Africa's poor mathematics results. Taylor, Van der Berg and Mabogoane (2013) found in The National School Effectiveness Study (NSES) that Grade 6 mathematics teachers have a low level of mathematics knowledge to teach the subject. This is supported by Spaul and Venkatakrisnan (2014) who found in their study that the content knowledge of 79% of Grade 6 mathematics teachers were below the level required for learners to pass Grade 6.

### **2.6.2 Most teachers are not subject specialists**

Makgato and Mji (2006:254) explain,

The Education for All (EFA) 2000 assessment (2005) reported that, in spite of approximately 85% of mathematics educators, being professionally qualified, only 50% have specialized in mathematics in their training.

A study conducted by Nkosi (2012) reveals that mathematics teaching in South Africa is in a crisis. Fewer teachers with mathematics specialisation are found at high schools only, while at primary schools there is no specialisation, leading to very poor performance at primary rural schools. As the Department uses Grade 3 and Grade 6 to benchmark performance with other countries, South Africa is always at the bottom. The Minister of Basic Education, Angie Motshega, responded, stating that:

South Africa is significantly underperforming in education in general, particularly mathematics teaching and learning. Mathematics teaching is often of poor quality, with teachers not able to answer questions in the curriculum they are teaching, one indicator of the challenge. Often national testing is misleading as it does not show the major gap at lower grade levels (DBE 2016).

Muller (2016:7-8), adds,

Mathematics abilities of primary school teachers are a problem experienced in many countries, including the US and UK, but particularly in South Africa where mathematics specialists are appointed at high schools and primary school teachers are trained as generalists. In particular mathematics teachers often possess transferable skills and relocate to other schools with better working conditions. Primary schools thus struggle to provide the crucial foundations for math, and secondary schools struggle to retain specialists who might be able to address the problem later.

As the study focuses on the improvement of mathematic results, the research reveals that principals have a great responsibility to develop, motivate and recruit mathematics teachers to improve the results.

### **2.6.3 Language of teaching and learning**

South Africa is a multilingual country with eleven official languages (Section 6 of the Constitution, Act 108 of 1996). The South African Constitution guarantees learners the right to receive education in the language of their choice. At the language conference in 2006, the then Minister of Education, Naledi Pandor, confirmed that African language learners should be taught in their mother tongue for at least the first three years of schooling before switching over to English. She also suggested that this system be extended to z 6. The present situation in the education system is that learners are taught in their mother tongue for the first four years (Grades R–3) of their schooling, and switch to English or Afrikaans from Grade 4.

A recent study (Cuvelier, Du Plessis & Teck 2015:3) concludes that the objectives of the *South African Schools Act* (Act 84 of 1996) is to provide a foundation for the protection and advancement of the country's diverse cultures and languages. Section 6 of this act empowers school governing bodies to determine the language policy of

schools within guidelines set nationally and on provincial level. However, research has proved that there are challenges in the performance of mathematics because of the mathematics language (basic skills and concepts), development and the transition in Grade 4 where five subjects are now taught in English. Furthermore, Berger (2014) concedes that the transition is more difficult for African language speakers because they learn in their mother tongue in the foundation phase and in English from Grade 4 onwards.

#### **2.6.4 Lack of parental involvement**

Lack of parent involvement is another factor that contributes to poor performance of learners. “Disengaged parents promote school failures and are helping create a generation of children who are less well educated than they are.” (Gentry 2011:1) Disengagement of parents in the learners’ learning result in lack of support to the learners by not providing resources, time management at home for homework and study, time to leave for school and book viewing. Mashau, Kone and Mutshaeni (2014:54) confirm that parents’ involvement is very important in the education of their children and point out the following key responsibilities of parents:

as educational stakeholders they need to ensure that their children get quality education, parents bring valuable quality to the education experience because they understand better and influence time management, study habits and eating practices, provide additional resources and encourage social development by attending school functions and participating in decision making.

#### **2.6.5 CAPS (Curriculum and Assessment Policy Statement)**

Du Plessis (2012:1, in Moodley 2013:32) views CAPS “as an adjustment to what we teach (curriculum) and not how we teach (teaching methods)” and further explains that although there was positive support for the new curriculum (RNCS), there has been considerable criticism of various aspects of its implementation. This resulted in teacher overload, confusion, stressed learners who could not read or write and widespread learner underperformance in international and local assessments.

Moodley appointed a task team to re-evaluate the curriculum and made the following recommendations. (Moodley 2013:35):

There be uniform grading descriptors for Grades R-12. The annual external assessments of mathematics, home language and English (FAL) be conducted in Grades 3, 6 and 9. In order to reduce the workload on learners and teachers, projects must be reduced to one per learning area and learner's portfolios were to be discontinued. The Department should provide targeted in-service development training and the higher education institutions (HEI) should align their teacher training programmes with the national curriculum. The nature of classroom and school support by the subject advisor to be specified.

The role of the textbook should be reassessed, and in this regard called for the development of a catalogue of textbooks aligned to the NCS. All textbooks must be provided to the learners.

The researcher wants to make an assumption and agree with the findings of Moodley (2013) that the curriculum changes were stressful and unproductive. With the CAPS it is better because resources like textbooks and workbooks are CAPS aligned.

#### **2.6.6 Behaviour of learners**

"Behaviour is the observable response or reaction of an organism, an individual or a system to a situation." (Minton & Khale, 2022). A negative attitude always results in poor performance and failure, but a positive attitude yields positive results like success and best performance in everything one does, in this case, towards mathematics performance. Langat (2015) concedes that several research studies support the fact that learners' success in mathematics depends on the learners' attitude towards the subject, as this determines their ability, willingness to learn, choice of action and response to challenges. It further determines the level of engagement, interest, personal effort without which one can hardly perform (Langat 2015).

#### **2.6.7 Attitude of teachers**

"Attitudes are generally evaluations that people hold regarding a particular entity, such as an object, an issue, or a person." (Lavrakas 2011) "A negative attitude is a disposition, feeling or manner that is not constructive, cooperative or optimistic." (Cheprasov 2018) A negative attitude amongst mathematics teachers results in poor performance in the subject. Cheprasov emphasises that if teachers can change their attitude and love the subject, their learners will be motivated and perform very well in mathematics (Odiri 2011). Berger (2014) points out that teachers' attitude to

mathematics achievement is a cause for concern; teachers have an unrealistic assessment of their competence. Furthermore, this is supported by (NEEDU 2013) which mentions that teachers and principals' attitudes impact on their willingness to see the need for improvement in their mathematics and science teaching. Lastly, CDE (2013) comments that this has significant implications for professional development programmes.

### **2.6.8 Technology in lessons**

With the increase of technology, students and teachers can take advantage of these on their tablets, computers and smart boards. Virtual and concrete manipulative reinforce mathematical concepts separately but a combination of both is the best way to achieve the best results. (Burns & Hamm 2011)

Websites can offer the engagement to lessons and the use of virtual manipulative through technology creates the opportunity to make meaning and see the relationships as a result of one's own actions. (D'Ambra 2018)

An effective integration of technology in the classroom is hard for some educators. They have to understand content, teaching and technology on nearly equal terms, and when one does not, it all has an awkward way of illuminating the holes in the teacher's expertise (Heick,2015). Education technology is costly, takes to time to practise and software programmes continuously change. For teachers who lack knowledge it is disruptive and time consuming, while to those who are knowledgeable it is transformational and useful. The current system of education is, at best, aging and rickety. For some teachers, technology is transformational. For others, technology is obscure, making a lot of noise in a room where they are trying to get important work done, like a rock band in a library. In the White-Hazy area, most schools have no technological equipment like smartboards, tablets and/or computers. There is no departmental funding for those, and teachers have no knowledge of using them in the classrooms.

## **2.7 THE ROLE OF PRINCIPALS IN IMPROVING MATHEMATICS RESULTS**

### **2.7.1 Recruitment of mathematics teachers**

Recruitment is an essential part of talent management and can be defined as “the process of searching the right talent and stimulating them to apply for jobs in the organization” (Sinha & Thaly 2013:142, in Koch, Gerber & De Klerk 2018)

Most qualified teachers leave the profession and the youth is not prepared to join the teaching fraternity due to the salary level, bad working conditions, learners’ ill-discipline, changes of curriculum and many other factors. In the process, mathematics teachers are also lost, and that leaves a gap in the performance of mathematics (Weale, 2019). The main response from government to the need to attract more teachers has been the Funza Lushaka bursary programme. Funza Lushaka represents an important new strategy and should be strengthened and expanded. Research has to expand to find out whether this strategy is yielding positive results. Many teachers can be attracted, whether they come in as job seekers or have a love for the profession that needs to be scrutinised. Van der Berg *et al.* (2011) confirm that “bursaries alone will not attract enough top-achieving candidates into teaching and are powerless to retain good teachers”.

#### *2.7.1.1 The role of principals in recruiting new mathematics teachers*

According to Learning Point Association (2013), the principal can do the following:

- Grow his/her own mathematics teachers.
- Form partnerships with institutions of higher education and create high-quality alternative routes to certification.
- Offer incentives to attract high-quality maths teachers to rural schools.
- Streamline the hiring process.
- Improve working conditions and provide support for mathematics teachers.
- Stem the tide of attrition and migration.

### **2.7.2 Development of math teachers**

Cox (2017:1) highlights that teaching is a life-long learning process. Teachers have to be willing to learn to adapt to new technology, new curriculum and new methodologies so that they can be relevant to the modern world.

Principals are stewards of learning, who value learning and commit themselves to it in their daily work. They understand the connections among teacher professional development, student learning and school quality. (Bredeson 2017:391)

### **2.7.3 HOD training**

Heads of departments at school level are leaders who are employed to do extra jobs, besides teaching, of managing a group of teachers, learners and classrooms, based on whether a primary school or a secondary school is (*Employment of Educators Act 76 of 1998:c-66*). At secondary schools the departments are separated by subject specialisation. Each sector of a subject has its own head of department (HOD), for example, an HOD for mathematics. The HOD for mathematics' role is to develop the teachers, subject policy, departmental policy, annual programmes, schedules, duty lists and timetables (*Employment of Educators Act 76 of 1998:P.c-66*). They are also expected to monitor, moderate, and ensure quality teaching and learning take place.

Primary schools are divided into phase and the senior phase runs over to high school. The foundation phase has its own HOD, and the intermediate (Grades 4–6) and senior phase (Grades 7–9) also has its own HOD. Depending on the size of a school, if the school has more learners, the phases get more than one head of department. At primary schools, the HODs are responsible for an entire phase with all its different subjects. The HODs at primary schools are not subject specialists; they have to monitor, moderate all the subjects. At primary schools the subjects are structured as follows: three in Grade R, four in Grades 1–3, six in Grades 4–6 and 9 in Grade 7–9). The findings of Makeleni and Sethusha's (2014) research highlight that teacher require training to implement curriculums effectively.

### **2.7.4 Team lesson planning to improve performance in mathematics**

Team teaching is about collaborative lesson planning and teaching, sharing of responsibilities during the lesson where one teacher leads, and the other teacher offers support. According to Fitzell (2016), team teaching has the following benefits: it creates effective, fun learning; teachers can use their knowledge effectively together; it keeps co- teachers involved in the class; allows for shared ideas, including enrichment and differentiation; breaks the monotony of one person doing all

instruction; and creates many spontaneous, teachable moments. A good team knows why it exists and its purpose is relevant, meaningful and clear (Hurley 2019). Team communication is the foundation of team collaboration (Liibert 2018). Team members trust one another (McQuerrey 2018). A good team has shared leaders (Chiu, Owens & Tesluk 2016).

A good team will plan their lessons in a shared capacity. All mathematics lessons need to be of a good or better standard to attain a positive outcome on the results of learners. The eight elements of an effective lesson are explained in Table 2.3

Table 2.4: The eight elements of an effective lesson(Lewis, 2019)

Elements of an effective lesson	Recent supportive literature	Possible impact on learning in mathematics
The essential question of the lesson is clearly connected to the learning objective.	Papadopoulos (2019) describes learning objectives as measurable sub-goals of a lesson and that they inform particular learning outcomes. Writing learning objectives keeps a teacher focused and helps him or her in planning. This is easily achieved with the use of action verbs that describe learner capabilities at the end of a lesson. From the learners' point of view, objectives help them to understand what the teacher expects of them and what they must expect of themselves.	Mathematics teachers need to write down the objectives of each lesson for them to be focused on what to achieve in each lesson. The teachers are also supposed to set clear questions that will help learners to understand what the teacher expects of them and what they must do themselves.
The starter activity is connected to prior knowledge or introduces the day's topic.	Smith (2018) points out that a solid lesson hook strategy has supreme power in engaging learners, capturing their imagination and maximising learning. It is an opportunity to inject energy into a new learning journey and to create eagerness to find out more. Lesson hooks make connections between existing knowledge and future learning.	An interesting introduction to a lesson will result in drawing learners' attention to focus on the up-coming lesson. Lesson hookers or starters are very important when teachers plan lessons. If they are going to be used by mathematics teachers, they may improve their lessons and in turn improve mathematics results.
For the majority of the instructional period, learners are engaged in the cognitive work with the teacher facilitating the learning process.	Mathews (2019) indicates that if learners can formulate their own opinion on something and it is connected to their lives, then they will be engaged. Learners want to feel heard, and they want to know where they fit in the world.	Mathematics teachers need to plan lessons that have most activities that engage learners. The teacher has to facilitate the lesson and make sure that the lesson is learner-centred. The lessons also need to be linked to their daily lives. In this way, mathematics results may be improved.



<p>The use of graphic organisers promotes the learning objectives and is conceptually aligned to the stages of learning.</p>	<p>Athuralira (2019) describes that using graphic organisers in lesson planning can be extremely useful for both teachers and learners as they will make them more engaging as well as easily comprehensible. They are used to organise information and ideas in a way that is easy to comprehend and internalise. By integrating text and visuals, graphic organisers show relationships and connections between concepts, terms and facts. Graphic organisers can be used on all grade levels, and have proven to be effective learning tools for gifted children and learners with special needs and also adults, and they can be used across the curriculum for teaching, learning, and note-taking.</p>	<p>To improve primary school results in Mpumalanga, different useful strategies need to be employed, including the use of graphic organisers. There are different types of graphic organisers which teacher can carefully select as they plan their lessons. These organisers have been researched and found to be useful. Information become comprehensible because they intergrade text and visuals, which can be made colourful and help learners to understand the lessons better.</p>
<p>Learner groups are based on educational needs and priorities. Groups engage in meaningful learning that is linked to the learning objectives. Teacher support groups allow them to reflect on their task and learning outcome.</p>	<p>Renner (2018) describes that group work benefits include increased learner ownership of subject matter and the opportunity for struggling learners to get help from stronger learners without having to ask. Learners reinforce soft skills like planning and communication. They can also learn accountability, problem-solving and project management. Project-based learning also creates opportunity for learners of different learning styles to collaborate while still interacting with the material in the way is most beneficial to them.</p>	<p>Group work has its advantages and disadvantages. Focusing on advantages in planning for Mathematics lessons, it could help learners to learn independently, get information from peers and express themselves openly without fear of adults. Learners can also reveal and share their mathematics learning skills openly.</p>
<p>Learning activities are appropriately differentiated with the use of cooperative learning structures.</p>	<p>Weselby (2020) points out that differentiating instruction may mean teaching the same materials to all learners using a variety of instructional strategies, or it may require the teacher to deliver lessons at varying levels of difficulty based on the ability of each learner.</p>	<p>In any learning situation, learners are not acquiring knowledge the same way. Everyone is learning differently; teachers have to accommodate different learners in their lesson plans. There are also different levels in each class. Mathematics educators have to plan their lessons and include differentiation of instruction and taking into cognisance the different levels to improve mathematics results in Mpumalanga.</p>
<p>A variety of questioning techniques are used with an emphasis on higher level Bloom's questions. Learner are given time to think and respond.</p>	<p>Kelly (2020) describes that to incorporate Bloom's Taxonomy into lessons, present different levels beginning with the most basic at the beginning of a unit. Once you reach the end of a unit,</p>	<p>In each and every class, there are about three groups of different cognitive levels groups of learners. Each group acquire knowledge at different levels. To improve mathematics results,</p>

	the lessons should incorporate the highest levels of Bloom's Taxonomy. There are six levels ranked in order from the most basic to the most complex, guided by verbs. The new version is: Remembering, Understanding, Applying, Analysing, Evaluating and Creating.	teachers have to develop their lessons and assessment questions according to the different cognitive levels. The assessment task or activity should be composing of lower-level questions, middle level-questions and higher-level questions. The lesson plans and question papers should be balanced.
The plenary activity is clearly connected to the "essential question" and the learning objectives. All learners are required to demonstrate their learning independently and the teacher provides appropriate feedback as needed.	The study by Pearson English (2018) reveals that learners who are actively involved in deciding what and how they learn are typically more engaged and motivated. They further highlighted that effective feedback allows learners to understand where they currently are in their learning, where they are heading and how they will get there. Teacher feedback also helps learners to develop the skills needed to become more independent. Peer feedback is advantageous and encouraged.	Mathematics is a practical subject; learners have to be 'hands-on' to understand it better. Teachers need to prepare thoroughly, giving clear instructions and workable activities. In most cases the learners have to be given more time to do the work themselves, whilst the teacher monitors and gives feedback. If learners are actively involved, they may not easily forget what they have done.

To promote team planning and team teaching, principals can ensure the formation of subject committees or groups at a school level. Principals may also encourage teachers to work together and reinforce the benefits of team planning. According to Fitzell (2016), team teaching has the following benefits: it creates effective, fun learning, teachers can use their knowledge effectively, it keeps co- teachers involved in the class, allows for shared ideas, including enrichment and differentiation, breaks the monotony of one person doing all the instruction and creates many spontaneous, teachable moments.

### **2.7.5 Encourage parental involvement**

Parent involvement or engagement is a useful tool in supporting the learning of learners at school. In an article on the importance of parent involvement in education Hinkle (2017:1) states,

Both students and schools benefit when parents are involved in education. Academic achievement and standardized tests are higher, students have a more positive attitude towards school and their behaviour is better. Other benefits include more successful academic programmes and schools that are generally more effective.

Parents can be involved by having one-on-one sessions with teachers, book viewing, volunteering at school doing some activities like cleaning, help teachers with marking, assist with fundraising and many other ways that seek to improve the school. Post (2016:1) confirms that,

when parents get involved, children's schooling is affected through their acquisition of knowledge, skills, and an increase sense of confidence that they can succeed in school and affirms that parent involvement, for teachers boosts positive self-perception and job satisfaction.

He highlighted the following strategies:

- Help parents to find a balance that works for their child.
- Provide information and ideas about how to best assist with homework and other curriculum-related activities (Post 2016:1).
- Set up clear homework policies.
- Detail how parents should be involved. Ask parents to stick to a study routine and set up a homework-friendly area where distractions are kept to a minimum. That means enforcing a no-TV, computer or phone environment (Post 2016:1).
- Suggest enrichment activities. This will also help parents to build constructive relationships with their children. Some good ideas include “fun science experiments, family trips to the library, appropriate museum exhibitions, theatrical plays, celebrate unique events like Father's Day and Mother's Day, encourage volunteering such as baking of cakes, washing cars and have career and skills talks” (Post 2016:2).
- Parents and teachers must have a good relationship with one another. Teachers have to introduce themselves to parents at the beginning of the year, where they explain about curriculum, resources, contact information and how parents can help them. Talk with parents and not at them. Establish a rapport of equality by welcoming the parent's inputs and suggestions (Post,2016:2).
- Principals may conduct parents' meeting and encourage parents to be involved in the education of their children. The principal can also develop programmes with the staff where parents may be engaged through one-on- one sessions with teachers and book-viewing. They may be encouraged to volunteer at school cleaning, help teachers with marking, assist with fund-raising sporting

activities and many other ways that seeks to improve the school. Post (2016:1) confirms that when parents get involved, children's' schooling is affected through their acquisition of knowledge, skills and an increase sense of confidence that they can succeed in school and affirms that parent involvement, for teachers boosts positive self-perception and job satisfaction.

### **2.7.6 Building staff morale**

Teachers are the main core of learning, without teachers there is no successful world; the world will be dark and dead. In recent years, teachers' morale towards their work has dropped remarkably due to many factors like poor working conditions, salary levels, and negative attitude of learners, disciplinary factors, safety issues, lack of parent support and lack of resources. Shalem and Hoadley (2009:1) argue that

the relationship between enduring economic inequalities in South Africa, an underspecified new curriculum, and the bureaucratization of teachers' work have created an intractable pattern of accumulation of educational disparity among teachers in South Africa.

Most of the primary schools in the White-Hazy circuit (Mpumalanga) are located in rural areas with very bad working conditions and an undersupply of resources. Another challenge, as the research specifies, is that the National Curriculum Statement is found to be under- specified in terms of content to be taught, progression, assessment, and the language of teaching and learning in mathematics in the foundation phase. The foundation phase was supposed to be laying a strong foundation for the mathematics concepts, on which teachers in the intermediate phase were supposed to build on, but they have to teach the concepts afresh in English. In our area, mathematics concepts are taught in siSwati in the foundation phase, changing to English in the intermediate and senior phase. The work of teachers is also arranged bureaucratically. Teachers are given annual teaching plans (ATPs), which they have to follow when teaching, they are not allowed to divert and teach what they think will benefit the learners. Teachers are not involved in planning the curriculum content of what they are supposed to teach in class or grade. Hofmeyr (2010) substantiates that the Revised National Curriculum Statement (RNCS) was implemented without enough targeted teacher training that was subject-specific or enough resources for teachers and learners in most schools. In addition, it over-emphasizes assessment and

associated administration, and so overloads teachers with tasks that are not related to teaching.

### **2.7.7 Positive behavioural management strategies**

Positive classroom management provides a good platform for learning to take place. If learners misbehave in class or at the school, they tend to be less productive and disturb teaching and learning. Guido (2018) confirms that poor classroom management will increase stress and burnout for teachers. Furthermore, he recommends a few positive strategies that could be implemented by teachers to have well-behaved and teachable classrooms:

- Teachers must demonstrate and model the behaviour they want to see in their classrooms will effectively teaches learners how to act in different situations, for an example, use polite language, maintain eye contact, keep phones in your pocket, let one another speak uninterrupted.
- Teachers need to encourage learners to develop their own classroom rules.
- Teachers needs to print and distribute the list of rules that the class developed and go through the rules with them.
- Avoid punishing the class – address isolated behavioural issues and call out specific learners in a friendly manner.
- Encourage initiative and promote learner participation by allowing learners to work ahead and deliver short presentations to share positive learning experiences.
- Teachers need to offer praise because praise inspires the class to improve learners' self-esteem, reinforce rules and the values teachers want to see.
- Give tangible rewards such as raffle tickets for best behaviour in class.
- Make positive phone calls and write complimentary letters to their parents.
- Build excitement for content and start the lesson interestingly from the get go, for an example, "In this lesson, you will learn how to talk like your teacher."
- Address negative, bad behaviour quickly and privately.
- Teachers need to consider peer teaching where some learners' confidence is low, with poor interpersonal skills.

Mathematics teachers might benefit and improve results by implementing these

positive suggested strategies because they have been proven by research.

### **2.7.8 Participation in professional bodies**

Principals, HODs and teachers are encouraged to participate in developmental professional bodies like AMESA (Association for Mathematics Education of South Africa), SAPA (South African Principals Association), SACNASP (South African Council for Natural Scientific Profession) and many more. This will enrich them with knowledge on their areas of specialisation.

In 2019, principals and deputy principals nationally attended a conference held in Mpumalanga from 19 to 21 September. Mr Patrick Zwane, a director for further education and training development in the Mpumalanga Department of Education assigned to curriculum, deliberated on innovative and practical ways and means of implementing learner improvement strategies that work to deliver the intended outcomes in pursuit of excellence that we all yearn and strive for. He explained strategies such as knowing and focusing on the mission, goal setting and improvement planning, encouraging instructional leadership at schools; good curriculum management (implementation and accountability); effective and efficient curriculum delivery and monitoring; professional development and collaboration; differentiated and customised teaching and learning; effective views of different forms of assessment; and effective views of ICT (Information and Communication Technology) in teaching and learning (SAPA National Conference 2019).

## **2.8 SUMMARY**

This chapter explored the roles of school principals in improving mathematics results. The literature review covered issues of successful practices of school principals, factors that contribute to poor performance of mathematics at primary schools and schools in general. The theoretical framework expanded on the meanings of key terms. Chapter 3 will focus on research design and methodology.

# **CHAPTER THREE: RESEARCH DESIGN AND RESEARCH METHODOLOGY**

## **3.1 INTRODUCTION**

As stated in paragraph 1.5, the main research question for this study pertains to what the school stakeholders' perception of the role of the instructional principals in is improving Grade 6 mathematics results in the White-Hazy circuit in Mpumalanga.

The three sub-research questions that were formulated in paragraph 1.5 of which the answers would contribute to answering the main research question, are repeated:

- What are the characteristics of an effective school principal?
- Why can principals contribute to the poor mathematics results of intermediate phase learners at primary schools?
- How can principals improve the poor mathematics results of intermediate phase learners at primary schools?

For an understanding of the research problem, a literature study was conducted in Chapter 2, which provided information on the roles of principals, deputy principals and Grade 6 mathematics teachers in improving mathematics performance at primary schools at White-Hazy circuit in Mpumalanga. The type of effective leadership styles, factors that influence learner performance in mathematics, the role of school principals in managing the factors and the strategies to improve performance were discussed.

Chapter 3 explains how the research was conducted. It starts by clarifying the aims and objectives of the study, followed by the approach design. The sampling and site selection are discussed, followed by the data collection and analysis methods. The researcher further discusses the steps to be taken to ensure trustworthiness and the consideration of research ethics. Lastly, the limitations of the study will be considered.

## **3.2 RESEARCH AIMS AND OBJECTIVES**

The primary aim of this study was to investigate the stakeholders' perception regarding the managerial role of principals and deputy principals, and the expertise of Grade 6 mathematics teachers to improve the performance of Grade 6 learners in mathematics. In pursuit of the way in which a principal manages a school to improve

the quality of learning, and the strategies employed by mathematics teachers, in accordance with the research questions, the following research aims were formulated (par 1.3):

- To discuss the characteristics of an effective school principal briefly.
- To explore the reasons why principals can contribute to the poor mathematics results of intermediate phase learners at rural primary schools.
- To make recommendations on how principals can improve the poor mathematics results of intermediate phase learners at rural primary schools.

To achieve the set aims and objectives, the researcher conducted interviews with the primary school principals and deputy principals, as well as Grade 6 mathematics teachers who achieved the best Grade 6 mathematics results because their achievements show that they implement best strategies in improving poor results effectively. The strategies, approaches and knowledge shared served as cornerstones to help other primary school that underperform to improve mathematics results at their schools.

### **3.3 RESEARCH PARADIGM**

Brooks and Normore (2015:800) explain that one of the most important processes in research is the selection of an appropriate research design and then adapting it to suit the context of the study. The selected research design is qualitative, departing from an interpretive research paradigm. The study is regarded as a phenomenological study (par. 1.6.1) whereby individual interviews and analysis of documents are the techniques used to collect data.

#### **3.3.1 Qualitative approach**

For this study, the researcher used a qualitative approach. According to Crossman (2019), qualitative research is a type of social science that collects and works with non-numerical data that seek to interpret meaning from these data that help understand social life through the study of targeted populations or places. This approach is relevant for this study because it is more concerned with understanding a social phenomenon, namely how mathematics results can be improved. Patton (1993) lists the following characteristics of qualitative approach:



- Naturalistic inquiry (Studies a group in its natural setting). The five principals, deputy principals and Grade 6 mathematics teachers who participated in this study were interviewed online using Microsoft Teams at their schools or their places of choice. Due to the Covid-19 pandemic crisis, face-to-face interviews could not take place. Sutherland (2019) concedes that online interviews are effective. Some of the advantages he explored are that online interviews are cost efficient, saves time, it is convenient, accessible, flexible and anonymous.
- Holistic perspective. (Every action or communication become part of the whole phenomenon.) This research study collected data by observation, which focused on the actions of participants and interviews where information was gathered from interviewees' responses and document analysis; thus, a holistic perspective was employed.
- Dynamic system. (Change in a study is common because the researcher is not concerned with finding only one answer or right or wrong answer.) Initially the study only focused on principals and deputy principals, but as I continue, I realised that Grade 6 mathematics teachers are also key because their perspectives could provide some insight into the problem. They are the ones who teach the subject; therefore, they need to be part of the study. The topic became 'The role of principals in improving Grade 6 learners' performance in mathematics in Mpumalanga'.
- Unique case orientation. (Every study is special and deserves in-depth attention.) This study is unique as it brought the school managers to combine their strategies to improve mathematics results at primary schools, which might be the best way to improve the Grade 6 results, especially mathematics, which is an outcry in the whole education system.
- Context sensitivity. (Researchers must realise different variables, such as values and beliefs that influence cultural behaviours.) As a researcher in this study, I took cognisance of different values, beliefs and cultural behaviours of the different schools and their participants. I was sensitive in imposing my values, beliefs and cultural practices.
- Empathic neutrality. (Researchers should be non-judgemental when compiling findings.) As a researcher in this study, I held my judgements so that the findings could be as authentic as possible. I did not mention anything like

'School A performed better than School B because maybe it is led by a female principal'.

- Design flexibility. (Researchers can continue to do research on other topics or questions emerging from the initial research.) From this study, researchers can continue and further the research topic by looking at other stakeholders' roles in improving mathematics results like teachers, parents, curriculum implementers and the department. Principals' strategies to improve mathematics can also be researched, and the factors that influence mathematics results can also be studied as a topic. Mathematics teachers' perspectives and insights on the challenges of mathematics can also be studied as a topic.

### **3.3.2 Interpretive paradigm**

Interpretivism has its roots in hermeneutics, and the study of the theory and practice of interpretation. In hermeneutics the text is the expression of the thoughts of its author, and interpreters must attempt to put themselves within the perception or thinking patterns of the author in order to reconstruct intended meaning of the text (Nel 2018). Through an interpretivist paradigm, the researcher was able to view the research problem through the eyes of participants, i.e. the school principals, deputy principals and Grade 6 mathematics teachers, to interpret and construct data as research findings based on the experiences of the participants (Hammarbeg, Kirkman & DeLacey 2016:498-501).

Often also called 'anti-positivism' or 'naturalistic inquiry', interpretivism is a softer and more subjective way in which to interpret data. Interpretivism relates to the constructivist epistemology. This perspective holds that individuals, in their reasoning, do not have access to the real world, suggesting that their knowledge of the perceived world is meaningful in its own terms and can be understood through careful use of interpretivist procedures. It is marked by three schools of thought in social science research, namely phenomenology, ethnomethodology and symbolic interactionism. All three schools of thought emphasise human interaction with phenomena in their daily lives, and suggest a qualitative rather than a quantitative approach to social research.

### **3.3.3 Phenomenological study**

Phenomenological research interprets and describes experiences of the participants regarding a specific event in order to derive meaning from it (McMillan & Schumacher 2014:372). The researcher interviewed principals, deputy principals and Grade 6 mathematics teachers to hear their views on what factors cause Grade 6 learners to perform poorly in mathematics, what are the managerial roles to improve the performance, and what strategies they can implement. The principals, deputy principals and Grade 6 teachers were seen as the source of knowledge for the data needed by the study. Through phenomenology, the researcher developed a real-life understanding of the studied phenomenon by relying on first-person accounts (Sloan & Bove 2014), as this first-person account pertained to the strategies which can be implemented to improve Grade 6 mathematics results at primary schools.

### **3.3.4 Research methods**

Interviews help the researcher to gain a deeper understanding of social trends, as compared to the data collected using quantitative methods such as questionnaires. The purpose of interviews is to study the experiences, views or beliefs of an individual on a specific subject or topic (Bhasin, 2019).

The nature of individual interviews allows sensitive topics to be investigated and discussed in-depth knowledge and insight into the problem (Kaplowitz 2014), which, with this study, provided for rich data and contributed to an understanding of the experiences of participants on the strategies which can be implemented to improve the poor math results in Grade 6 mathematics. Individual interviews are effective in generating an understanding of the study, which, according to Ra'heim and Blystad (2016), provides the researcher with different topics and themes to shed light on the topic of study, which, in this case, related to improvement of Grade 6 mathematics results.

Principals were interviewed to share experiences on how they managed their schools to establish good Grade 6 mathematics results, an area of weakness at primary schools. The data they provided explained how principals at primary schools might manage their schools effectively to improve the Grade 6 mathematics results. The deputy principals heading the curriculum; they were interviewed to share their

experiences on how they managed the curriculum, which includes mathematics. The Grade 6 teachers are directly involved in teaching the subject. They were interviewed to share their experiences in teaching the subject and the achievement of good results.

In line with Turley (2016) careful rendering of different perspectives, subjective experiences, rich contextual detail and personal meanings lead to the construction of new knowledge, individual interviewing, contributing to a deeper understanding of causes of poor mathematics results in Grade 6 at primary schools and countering strategies to ensure satisfactory learner performance.

### **3.4 SELECTION OF SITES AND PARTICIPANTS**

As mentioned in paragraph 1.7.2, the research population consisted of 28 primary schools in the White-Hazy circuit, Mpumalanga Province. The research sites represented by five primary schools that have a good track record of performing in all subjects. Mathematics performance analysis was done from the year 2014 to 2018, a five-year period. The key performance indicators were discussed, including but not limited to: learner academic achievement, they achieved above the circuit set target of 75%; the discipline referrals were very minimal; attendance record were up to date and show maximum percentages; awards activities were taking place to motivate learners and teachers and teacher satisfaction was also at a very high rate.(Emery D,2016) The schools were also conveniently accessible to the researcher, with shorter distances. Due to Covid-19, I did not visit the schools; interviews were done online using Microsoft Teams. Principals, deputy principals and Grade 6 mathematics teachers act as primary instructional leaders at their schools. They were therefore considered as information-rich participants.

#### **3.4.1 Population**

McMillan and Schumacher (2014:64) define population as “a group of elements or cases, whether individuals, objects or events that conform to specific criteria and on which the researcher intends to generalize the results of the research”. The population for this study refers to all 28 primary schools in the White-Hazy circuit.

### **3.4.2 Site selection and sampling**

According to Singh (2018), a sample is a subset of a population and sampling is one of the most important factors which determine the accuracy of the research or survey results. In the context of this study the research sites were five primary schools in Mpumalanga selected on the basis of being a good performing school that met a required pass rate of more than 75%. From these five research sites, information-rich participants were selected by means of purposive sampling.

#### *3.4.2.1 Purposive sampling*

Purposive sampling was used for this study. According to Foley (2014), purposive sampling, also known as judgmental, selective, or subjective sampling, is a form of non-probability sampling in which researchers rely on their own judgements when choosing members of the population to participate in their study. The criterion used to select the five schools, their principals, deputy principals and Grade 6 mathematics teachers as participants is that they always perform and reach the circuit target of above 75%. Their school management teams, including the principal, are well structured and are regarded as effective when looking at their performance in the circuit. They can be regarded as instructional leaders. Marzano (2017) confirms that setting and sharing a clear, school-wide direction gives principals and the teachers a sense of purpose and identity. It gives the entire school a way to measure and monitor daily routines and to prioritise activities that contribute directly to furthering the school's direction, goals and vision.

#### *3.4.2.2 Sample size*

Tai and Ajjawi (2016:178) hold the view that a researcher needs to consider:

- the scope of the research;
- the nature of the research questions;
- the methodology; and
- the sufficiency in answering the research questions to decide on the size of the research sample.

Rosenthal (2016:511), in agreement with Tai and Ajjawi (2016:178), explains that “the size of a research sample should be big enough to develop a complete understanding

of the meaning behind the experiences and behaviours of the participants”. Rosenthal (2016:511) adds that during qualitative research, “small samples often generate large volumes of data from information-rich participants”. Gentles, Charles, Ploeg and Ann (2015:1783), on the other hand, adds that too few participants lead to “inconclusive data while too many participants result in a waste of resources once data saturation has been reached”. In line with the suggestions by Fitzpatrick (2015), “Thus an appropriate determination of the sample size used in a study is a crucial step in the design of a study.”

The sample size for this study was ideal and provided sufficient opportunity to collect information-rich data and to understand shared themes and topics. The school principals, deputy principals and Grade 6 mathematics teachers of the five different schools represented a total of 15 participants for this study, investigating strategies that might be implemented to improve the mathematics results at primary schools (par. 2.8).

### **3.43 Participant information**

With permission from the Department of Education of Mpumalanga to carry out the research, and ethics clearance from the University of South Africa, all school principals from the selected research sites were contacted via telephone, e-mail or letters requesting their participation in the research study. The school principals were requested to afford deputy principals and Grade 6 mathematics teachers the opportunity to participate in the individual interviews. The school principals and deputy principals were interviewed on their roles as leaders and their awareness of the factors contributing to poor mathematics results, as well as possible intervention strategies to improve mathematics results.

## **3.5 DATA COLLECTION**

Before the start of the empirical study, the researcher obtained ethical clearance from the Research Ethics Committee of the College of Education at the University of South Africa (Appendix B). The researcher also contacted and received clearance from the circuit manager of White-Hazy circuit 1 (Appendix C).

The researcher used a case study technique, which allows a researcher to use more than one technique to collect data. Interviews, and document analysis have been used for this study. This is a multi-method strategy of data collection to ensure validity, reliability and credibility of research findings (Kulkarni, 2013). McMillan and Schumacher (2010) refer to this method of validation as cross-validation of data. Furthermore, a case study can be defined as an intensive study about a person, a group of people or a unit, which aims to generalise several units (Heale & Twycross 2018). The researcher focused on different methods like interviews and document analysis. Individual interviews provided flexibility to the interviewees.

Deputy principals provided information on factors that contribute to poor mathematics results in Grade 6, strategies to improve the results, and what they regard as possible leadership styles that contribute to good performance. An interview guide was referred to during the conduct of individual interviews to ensure that all the relevant aspects were addressed.

The respective interview guides comprised essential themes regarding factors that affect Grade 6 results and participants' input on the management of these factors and strategies to improve the results (Appendix E). All interviews were online Microsoft Teams recorded for the purpose of analysing and transcribing the new data. Note taking during the interview was kept to a minimum to avoid distracting the interviewees (Oltmann 2016).

In qualitative research, collectability and sufficiency are the focus; therefore, data collection must arrange for rich data to answer the research question sufficiently (Nyumba *et al.* 2018).

### **3.5.1 Individual interviews**

Individual interviews were used to collect data from the five schools. "An individual interview is a valuable method of gaining insight into people's perceptions, understandings, and experiences of a given phenomenon and can contribute to an in-depth data collection." (Cronin, Frances & Coughlan 2013) "However, the interview is more than a conversational interaction between two people and requires considerable knowledge and skill on behalf of the interviewer." (Cronin *et al.* 2013)

In this study, school principals, deputy principals and Grade 6 mathematics teachers acted as key informants and they were questioned on their schools' daily schedules, with emphasis on their roles in improving Grade 6 mathematics results and strategies to deal with the factors that influence poor performance.

The individual online Microsoft Teams interview was organised to suit the interviewee and to enable the researcher to accumulate a full understanding of the teachers, deputy principals and school principals' experience regarding teaching and learning as the primary instructional leader of the school and management of all processes at the school. As mentioned by Adams (2015), in semi-structured interviewing, standard questions are taken up in an interview guide and asked during each interview, but additional questions can be asked during the interview if interesting topics come up. The researcher used open-ended questions that allow the interviewee to explain openly and elaborative on his or her views. Open-ended questions allow for follow-up questions.

### **3.5.2 Document analysis**

Selected and relevant school documents were analysed by the researcher during the data collection. Documents such as school assessment policies, school improvement plans (SIP), minutes from the mathematics committee, minutes of SMTs, minutes for staff analysis of results, teacher development reports, curriculum implementer's reports (Cis), curriculum researchers' reports like the National Education Evaluation and Development Unity (NEEDU) and schools' academic results for the past five years were examined.

The documents revealed aspects that were not found through the semi-structured interviews and improved the trustworthiness of the findings. Cohen *et al.* (2011) state that documents are useful in rendering the phenomena under study more visible. The documents analysed showed the consistency of performance and the effectiveness of the leadership styles of the principals and teachers. Information written down is like 'actions' which 'speaks louder than words'; thus, what is documented provided the researcher with clear pictures of the schools under study. The schools are led by instructional principals who know their roles in managing factors that influence mathematics results at primary schools in the White-Hazy circuit.



### **3.6 DATA ANALYSIS**

For this study, data were analysed and interpreted inductively. The researcher used inductive analysis to identify themes and categories by analysing documents and conducting interviews. “Qualitative researchers use inductive analysis to make meaning from the data, starting with specific themes and ending with patterns and categories.” (McMillan & Schumacher 2014:395)

Data analysis comprises a technique of comparing and contrasting. As suggested by McMillan and Schumacher (2010:369), by comparing and contrasting themes, the researcher gained a holistic understanding of the data, which resulted in the formulation of flexible themes to be adapted and changed as the analysis process continued and new data were gathered. With reference to McMillan and Schumacher (2010:367-380), with video recordings as primary aid for data collection, the researcher used field notes to supplement audio recordings. The audio data were transcribed and typed for visual review.

The transcribed data were coded by identifying segments of information that contained valuable ideas and information. Each segment was labelled with a unique code. By repeating the coding process with all data collected, the researcher was able to remove duplications and test the relevance of all the codes allocated. Themes were generated from coding based on the recurrence of segments. A relationship between the different themes was established. These relationships emerged into main themes to represent answers to the research questions. As emphasised by McMillan and Schumacher (2010:367-380), the researcher continually returned to the data to validate each newly identified theme.

The researcher collected the data and grouped them in different categories according to themes and organised them in different files using different colours. In conjunction with data recorded on a tape recorder, the researcher interpreted the data and wrote a report on the findings.

### **3.7 TRUSTWORTHINESS**

It is pertinent to address how qualitative researchers establish how research study’s findings are credible, transferable, confirmable and dependable, since they do not use

instruments with established metrics about validity and reliability (Statistics Solutions 2016). Different strategies to enhance trustworthiness of the study were used at all the stages of the research, from the preparation phase (sampling and data collection) to the organisation phase (data analysis and interpretation).

As pointed out by Pilot and Beck (2014, in Connelly 2016), trustworthiness or rigor of a study refers to the degree of confidence in data, interpretation and methods used to ensure the quality of the study. This implies that the strategies for the improvement of Grade 6 mathematics are relevant to other primary schools that face similar challenges or factors that affect performance in mathematics. Rigor was achieved because principals and deputy principals manage the curriculum of which the factors and strategies to improve are part of their daily duties. To ensure trustworthiness of the data, confirmability, credibility, dependability and transferability are discussed in the next paragraphs. The methods used to support trustworthiness of the study at hand are explained below.

### **3.7.1 Credibility**

'Credibility is about how researchers ensure the proper identification and description of the phenomenon and the contribution of the research to the knowledge on the subject (Marshall & Rossman, 2016; O'Leary, 2014). This boils down to the question of how one knows that one's findings are true and accurate (Statistics Solutions 2016). The researcher analysed the methods used and did 'member checking' to assure trustworthiness. There are many techniques to gauge the accuracy of the findings, such as data triangulation, triangulation through multiple analysts and 'member checking'. In reality, the participants are the only ones who can reasonably judge the credibility of the results.

During the research investigation the following was applied to ensure the credibility of the study (Taylor & Francis 2017):

- The researcher adopted appropriate well-recognised research methods. The use of qualitative investigation in this study was accurate and relevant. The findings of the study were congruent with reality.
- Iterative questioning during interviews provided for further credibility of the data obtained. The repetition of similar questions during the individual interviews

allowed the researcher to investigate the same idea and concepts from the perspectives of the school principals and deputy principals and Grade 6 mathematics teachers.

- Tactics to ensure the honesty of participants were enforced. Participants could refuse to answer some questions. Data collection sessions involved participants who were willing to take part in discussions and who offered their opinions freely, resulting in honest and credible data collected.

In this study, only the principals, deputy principals and teachers of the schools under research can judge the credibility of the results.

### **3.7.2 Confirmability**

Confirmability is the degree of neutrality in the research study's findings. In other words, this means the findings are based in participant's responses and not any potential bias or personal motivations of the researcher to establish confirmability, the researcher can provide an audit trail, which highlights every step of the data analysis that was made in order to provide a rationale for the decision made. (Statistics Solutions 2016)

During the research study, the following was applied to ensure the confirmability of the findings. As pointed out by Statistics Solutions (2017), confirmability is there to verify that the findings are shaped by participants more so than they are shaped by qualitative researcher. This criterion has to do with the level of confidence that the research study's findings are based on the participants' narratives and words rather than potential researcher bias.

A detailed methodological description enables the reader to determine what extent the collected data and conclusions emerging from the research findings are relevant.

The researcher ensured that all personal beliefs and assumptions were admitted. With the collection and interpretation of data the researcher focused on the information at hand and not on her personal views on the research questions.

As a researcher, I did not reveal opinions on any findings and participants' responses, and in the end the responses and findings were availed, read and discussed with the participants to ensure authenticity.

### **3.7.3 Dependability**

Dependability is the extent to which the study could be repeated by other researchers to ensure that the findings are consistent. A qualitative researcher can use inquiry audit in order to establish dependability, which requires an outside person to review and examine the research process and the data analysis to ensure that the findings are consistent and could be repeated (Statistics Solutions 2016).

During the research investigation, the following was applied to ensure the dependability of the findings (McMillan & Schumacher 2010; Marshall & Rossman 2011).

A description of the study's research methodology and research design is explained in paragraph 1.7 and Chapter 3.4. This allows for the study to be repeated in future which enhances the dependability of the findings.

The research study was documented and will be registered under research articles for other researchers to use and continue with the research study. It is very possible that the research findings will be consistent because all schools' main objective is performance.

### **3.7.4 Transferability**

Transferability is how the qualitative researcher demonstrate that the research study's findings are applicable to 'other' contexts, can mean similar situations, similar populations and similar phenomena. Qualitative researchers can use thick description to show that the research study's findings can be applicable to other contexts, circumstances and situations (Statistics Solutions 2016).

A sufficient number of schools and participants were included in the sample size. Interviewing five school principals, five deputy principals and five mathematics teachers in the selected schools enhanced the transferability of the research findings.

All the participants fulfilled the role of instructional leaders at their schools. As instructional leaders, participants were able to contribute purposefully to instructional leadership-related matters pertaining to the effective management of factors that contribute to poor performance of Grade 6 mathematics and strategies to improve learner performance.

Individual interviews with school principals, deputy principals and Grade 6 mathematics teachers lasted between one hour and one and a half hours. This study is transferable. The findings are applicable to 'other' contexts, as all schools are concerned with the performance of learners, are headed by principals and curriculum is headed by deputy principals. Similar results can be obtained by other researchers in different contexts.

### **3.8 ETHICAL CONSIDERATIONS**

"Research ethics is specifically interested in the analysis of ethical issues that are raised when people are involved as participants in research." (Walton, 2015) They include informed consent, anonymity and confidentiality and protection of human rights. Research ethics considered during the study are discussed in the following paragraphs.

#### **3.8.1 Ensuring informed consent**

Informed consent is an ethical and legal requirement for research involving human participants. It is the process where a participant is informed about all aspect of the trial, which are important for the participant to make a decision (Nijhawan 2013). The purpose of the study explaining the aims and objectives has to be discussed with the participants. Written information has to be given to the participants prior to data collection and the participants have to agree to participate in the study. For this study the purpose and procedures were clearly laid out on the consent form. The participants signed and consented to participate. Where they needed clarity, they were informed by the researcher.

#### **3.8.2 Voluntary participation**

Ummel and Achille (2016:808) concur that all participants be allowed equal opportunities to participate in the investigation. Participants may withdraw any time without any required explanation or justification for their decisions and actions.

#### **3.8.3 Protection of human rights**

The researcher must ensure that when conducting a study, he/she does not violate human rights. Under this study, human rights, as stipulated in the Constitution of South Africa (1996), under the Bill of Rights has been considered and protected when

interacting with the participants. Examples of the rights are the right to privacy, the freedom to withdraw, the right not to be harmed in any manner, the rights of ‘vulnerable’ groups and many more.

### 3.8.4 The right to anonymity and confidentiality

The participants for this study were well informed and assured that the information gathered is only for study purposes, and will never be disclosed to anybody or authority outside the study. They were also asked to treat the information with confidentiality. This is a requirement for research ethics. McMillan and Schumacher (2014:362) confirm that, when “stating that a credible research design involves not only selecting participants and informing them of necessary content of the study but also adherence to research ethics”. The participants were also coded for anonymity. The five schools were given pseudonyms so that they could not be identified easily, which is also a requirement to the code of ethics.

*Table 3.1: Selected and participants*

Schools	Principals	Deputy principals	Grade 6 teachers
School A	A1	A2	A3
School B	B1	B2	B3
School C	C1	C2	C3
School D	D1	D2	D3
School E	E1	E2	E3

### 3.9 LIMITATIONS

Each research design is subjected to numerous limitations. This study was confined to principals, deputy principals and Grade 6 mathematics teachers at only five primary schools in the Mpumalanga Province. Due to Covid-19, the research was also limited to two methods of data collection, i.e. online individual interviews and document analysis. The researcher was not able to go to schools to conduct interviews and collect data.

### 3.10 CONCLUSION

Chapter 3 of this study described the research aims and objectives, research approach, research design and methodology, which included the population, sampling and site selection, as well as the data collection and analysis. It further deliberated on the trustworthiness of the study, of which credibility, confirmability, dependability and

transferability were discussed. The study further considered research ethics, which included ensuring informed consent, the protection of human rights and the right to anonymity and confidentiality of participants. Lastly, the limitations of the study were discussed. The following chapter will focus on the data collected. The data will be analysed, presented and interpreted.

# CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

## 4.1 INTRODUCTION

Chapter three of this study outlined the research design and methodology. The methods of collecting data and tools used to collect and analyse data were thoroughly discussed. This chapter will pay special attention to the analysis and the interpretation of the data collected from the semi-structured individual interviews with the different participants. The participants include the school principals, deputy principals, and Grade 6 mathematics teachers. Document analysis is also used as another tool for data collection.

The data collected are represented by using themes and sub-themes obtained from the data. In Chapter 2, the literature review showed that the school management team, especially the principals, plays a major role in improving learners' performance in mathematics by managing the factors contributing to mathematics' poor performance.

This study focused on investigating school principals' role in implementing different strategies to improve the inadequate intermediate phase (Grade 6) mathematics results in Mpumalanga, Ehlanzeni district primary schools. The interview questions intended to clarify the different factors that contribute to poor mathematics results of intermediate phase learners in primary schools, the characteristics of effective principals, and the strategies that principals can use to improve the intermediate phase mathematics' results in primary schools. The following themes and sub-themes emerged from the data:

*Table 4.1: Themes concerning strategies to improve mathematics performance in Mpumalanga, Ehlanzeni district primary schools.*

Themes	Sub-themes
Theme 1: Reasons why principals contribute to poor mathematics results of intermediate phase in primary schools.	Sub-theme 1. Lack of specialisation in mathematics. Sub-theme 2: The language of teaching and learning. Sub-theme 3: The lack of parental involvement. Sub-theme 4: The implementation of the new curriculum. Sub-theme 5: The attitude of mathematic teachers and learners.
Theme 2: Characteristics of an effective principal.	Sub-theme 1: Leadership style. Sub-theme 2: Role of principals in managing poor mathematics performance.



Theme 3: Principals' management strategies and approaches to improve mathematics results.	Sub-theme 1: Recruitment of mathematics teachers Sub-theme 2: Staff development Sub-theme 3: New ways of teaching Sub-theme 4: Parents involvement
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The themes mentioned above and sub-themes are discussed in detail under specific headings. The main themes include an effective principal's characteristics, the factors that contribute to poor mathematics results of intermediate phase in primary schools, and principals' management strategies to improve mathematics results.

Due to the Covid-19 pandemic, interviews were done through Microsoft zoom meetings. The researcher used verbatim quotations to point out direct responses and words from the participants. I used credibility, confirmability, transferability, and dependability to ensure trustworthiness in my study (par. 3.7.1; 3.7.2; 3.7.3 and 3.7.4). The following section will deal with the study population, including primary schools from Mpumalanga Province, at Ehlanzeni district.

#### **4.2 PRIMARY SCHOOLS AT EHLANZENI DISTRICT**

The Mpumalanga Department of Education consists of three districts, namely Nkangla, Gert Sibande, and Ehlanzeni. The Ehlanzeni district consists of 366 primary schools with different ethnic groups and cultures. There are fourteen (14) circuits within the Ehlanzeni district, and the circuit under study is the White-Hazy circuit, which consists of thirty-two (32) primary schools. The selected schools that form part of the study provided a complete representation of the different cultures and ethnic groups that make up the Ehlanzeni District.

The following section will outline the selected schools' detailed data, principals, deputy principals, and Grade 6 mathematics teachers. Codes were used for the participating schools, principals, deputy principals, and mathematics teachers to adhere to this study's ethical considerations, ensuring confidentiality and not infringing on the participants' right to privacy (par. 3.8.4)

### **4.3 A BRIEF DESCRIPTION OF SELECTED PRIMARY SCHOOLS, PRINCIPALS, DEPUTY PRINCIPALS, AND GRADE 6 MATHEMATICS TEACHERS**

#### **4.3.1 Selected primary schools**

The five primary schools selected for this study are public schools, four of them are situated in rural areas, and one is found in the semi-urban area. In the first four schools, the language of teaching and learning in the intermediate and senior phase is English second Language (FAL), and in the foundation phase, it is siSwati. At the school in the semi-urban area, English home language teaches and learns English as a language of instruction. The language usage structure of English second language and siSwati represent the majority of schools and different cultures and racial groups of the Ehlanzeni District. In percentage, the language usage structure represents 99,8% of the Ehlanzeni schools. About 2% of the former model C schools use English or Afrikaans as the main language s of teaching and learning. The number of learners per school varies from 350 to 1800, and the number of teachers from 20 to 35.

The Department of Education employs the principals, deputy principals, and Grade 6 mathematics teachers. Due to the Covid-19 pandemic, the researcher collected data from the participants via the Microsoft zoom programme by arranging interview meetings with the participants.

#### **4.3.2 Selection of principals (Principals: A1, B1, C1, D1, E1)**

##### *4.3.2.1 Age*

The ages of the principals varied between 48 and 60 years.

##### *4.3.2.2 Gender*

Three of the selected principals were females, and two were males.

##### *4.3.2.3 Teaching experience*

The youngest principal has 18 years of teaching experience. The other principals have more than 24 years of teaching experience. These principals should know the school's outstanding management and curriculum management, including managing factors that influence poor mathematics results and implementing strategies to improve the results.

#### *4.3.2.4 Experience as a principal*

The number of years' experience as principal varied from 7 years to 28 years. The participant with seven years of experience was the youngest.

#### *4.3.2.5 Highest qualifications*

All the participants in this study have obtained post-graduate degrees. The highest qualification of two of the participants is a Master's degree in Education Management. The other three have obtained an Honours in Education. As these principals are all well qualified, they have insightful knowledge and expertise about managing teachers, learners, and curriculum.

### **4.3.3 Deputy principals' profiling (A2, B2, C2, D2, E2)**

#### *4.3.3.1 Age*

The ages of the deputy principals varied between 46 and 55.

#### *4.3.3.2 Gender*

All five selected deputy principals were females.

#### *4.3.3.3 Teaching experience*

All the selected deputy principals have more than 17 years of teaching experience. These deputy principals should have enough knowledge of the successful management of a school and curriculum management, based on the number of teaching experience. Most of the deputy principals have more than 18 years of teaching experience, of which the highest number of years' teaching experience is 22 years.

#### *4.3.3.4 Experience as a deputy principal*

The number of years experienced as deputy principals varied from two (2) to eight (8).

#### *4.3.3.5 Highest qualifications*

All the participants in this study have obtained post-graduate degrees. The five (5) deputy principals have obtained an Honours Degree in Education. These deputy principals are all well qualified. They have insightful knowledge and experience in the management of learners, teachers, and curriculum in particular.

During data collection in qualitative research, some steps and procedures need to be considered to ensure trustworthiness (par. 3.7). Subsequently, the data collection preparation process will be discussed in the following section.

#### **4.3.4 Grade 6 mathematics teachers' profiles (A3, B3, C3, D3, E3)**

##### *4.3.4.1 Age*

Ages of the Grade 6 mathematics teachers varied between 40 and 51 years.

##### *4.3.4.2 Gender*

Three of the selected Grade 6 mathematics teachers were females, and two were males.

##### *4.3.4.3 Teaching experience*

All the selected Grade 6 mathematics teachers have more than 25 years of teaching experience. These teachers should have enough knowledge in teaching mathematics and management of factors that influence poor mathematics performance and implementing strategies to improve mathematics results, based on the number of years' teaching experience. All of the teachers have more than 15 years of teaching experience, of which the highest number of years' experience is 25 years.

##### *4.3.4.4 Highest qualification*

Two of the participants in this study have obtained post-graduate degrees (Honours degree in Education). Three of them have teaching diplomas (PTD), Primary Teachers Diploma (2), and (STD) (Secondary Teachers Diploma (1). As these teachers are well qualified, they have deep knowledge and expertise in teaching mathematics and implementing improvement strategies.

During data collection in qualitative research, some steps and procedures need to be considered to ensure trustworthiness (par. 3.7). The data collection preparation process will be discussed in the following section.

#### **4.4 PREPARATION PROCESS FOR DATA COLLECTION**

The researcher had to build trust with the participants, especially the school principals, as they are the institutions' heads under study. Due to the Covid-19 pandemic, there

were no visits allowed at the schools, and the University did not allow its students to do face-to-face interviews. Due to this reason, the researcher did not meet the principals, deputy principals, and the teachers in person. Requests to conduct interviews were made through emails. I sent written requests to all the principals of the participating schools first. After their consent, the requests were extended to the deputy principals and the Grade 6 teachers from the same participating schools. I obtained consent from the participants to record the interviews. In the consent forms, the study's content and the data usage were indicated for the participants. The signed consent forms from the participants were treated with delicacy by me (par. 3.8.1).

The principals also sent the documents requested by me for analysis by email (par. 3.5.2):

- Schools' results for the past five years;
- School Improvement Plan(SIP);
- Minutes of the mathematics committee;
- Minutes of the school management team(SMT) on the analysis of results;
- Minutes of the staff on analysis of results,
- Teacher development reports and
- Curriculum Implementer's reports(CIs).

## **4.5 DATA COLLECTED THROUGH DOCUMENT ANALYSIS**

Document analysis is a systematic procedure for reviewing or evaluating printed and electronic (computer-based and internet transmitted) materials (Bowen, 2009). Documents were collected from the five well-performing schools. The documents might assist the researcher in identifying strategies that could help underperforming schools improve their math results.

### **4.5.1 School improvement plan (SIP)**

All the schools in this study have school improvement plans, and it is a two-/three-year plan that includes the institution's whole functionality, namely, academic, administration, management, governance, and human resource management. The school improvement plan aims to improve quality at the school by selecting areas of improvement and arranging the according to prioritization to develop a programme

and improve. In all the SIPs the researcher analysed, Mathematics improvement and mathematics teacher recruitment and Development were prioritized.

#### **4.5.2 Minutes for the mathematics committee**

All the schools under study have a committee that deals with Mathematics issues, including challenges in mathematics and strategies to improve mathematics results. The committees comprise mathematics teachers from different grades and mathematics heads of departments (HODs). Minutes are kept in the principals' office with the rest of the school files, but all members have copies in their files. They meet monthly in all the schools.

Most participants' responses revealed that mathematics committees are used to discuss challenges faced with mathematics teachers and develop strategies to improve mathematics.

The Mathematics committee meets monthly to look at challenges, progress and ways of improving the subject across the grades (Principal D1).

Principal C1 agrees with Principal D1,

Monthly meetings are held at our school to discuss progress, challenging topics and strategies to improve Mathematics. These meetings are organized and led by the Mathematics committee" (Principal C1).

Deputy principal C2 also agrees with both Principal D1 and Principal C1,

As a deputy principal, I sit in all the subject committees at our school, including Mathematics committee, where we look at monthly activities, challenges and improvement strategies (Deputy C2).

Subject committee meetings are part of the strategies to improve results because challenges are discussed to develop good strategies. Mathematics teachers could develop working strategies if they meet regularly, discuss their challenges, and put forward some strategies. Chand (2018) agrees with the above statement when stating that the purpose of a meeting is an exchange of information in a planned manner and to discuss issues set out before the members to arrive at decisions, solve problems, exchange ideas and experiences, to plan and prepare for action, to review past performance and evaluate it, and to come up with new recommendations. After finding

out their challenges, mathematics committees draw an improvement plan with activities arranged according to specific dates.

#### **4.5.3 Minutes of the SMT on the analysis of results**

SMTs in all the schools have curriculum meeting programmes, which are scheduled monthly. The programme aims to unpack curriculum matters, analyse results, discuss monitoring, discuss challenges, and put up strategies to improve school results. Mathematics as a challenging subject is always highlighted amongst the challenging subject. The SMT always have their own strategies to improve mathematics, which they further discuss with the mathematics committee. Analysis of results is specifically done after every term. Principal B1 stated,

After every term, as an SMT, we meet and analyse the performance of the school. We look at the overall performance against our target, subject performance, grade performance, challenges, and strategies to improve. Mathematics is always among the subjects that need improvement.

Deputy C2 agrees with Principal B1,

At our school, at the SMT level, we analyse the term results to find out how each subject has performed. In the process, we look at the pass percentage, the challenges and the strategies to improve.

Analysis of results is an important activity in a school after issuing results and will determine the school's performance; without the analysis, the school will never know whether it is underperforming, satisfactory, or performing at an excellent level. As the leadership of the school, the SMT need to analyse the school results; with mathematics analysis, they can come up with management strategies to improve the subjects such as Recruitment of maths teachers (2.7.1); development of mathematics teachers (2.7.2); buying of resources; encouraging parent involvement (2.7.5); encourage team planning and teaching (2.7.4) and many more.

Researchers at the University of Georgia (2020) defined results as a report that provides a breakdown of student scores by results. It displays how many students answered correctly and incorrectly and how many students achieved each performance level for the activity in question. The SMT mainly concentrates on the

percentages and the performance levels, and if Mathematics is performed with lower levels, they must come out with strategies to remedy the situation.

#### **4.5.4 Staff minutes on the analysis of results**

All the schools under study have the programme and schedule staff meetings on the analysis of results. They have one meeting quarterly after the issuing of results to parents. The analysis is done per subject. The purpose is to look at challenges and to put forward strategies to improve. In all the analysis done at each school, mathematics challenges are always there. Teachers have put their strategies to improve mathematics performance. Teacher A3 stated,

We analyse the results every term, to unpack the performance of all the subjects, listing the challenges, and coming up with different strategies to improve. Some of the challenges form part of the school improvement plan, and each subject committee lists their s to analyse them in their groups further.

Teacher C3, in agreement with Teacher E3, explained,

As staff members, we meet every term to analyse the results. We do subject analysis, looking at whether each subject has reached the set target or not, the levels, challenges, and strategies to improve. Common challenges are included in the school improvement plan.

Teachers are the key-role players in education. They have to reflect on their performance, by analysing the results to find out where they had challenges and develop a plan to improve.

According to the researchers from The University of Georgia (2018), who agree with the teachers' responses, teachers can:

- Identify students just below the performance level to help move them to the next level.
- Identify students in danger of falling below a performance level to reinforce their understanding of concepts.
- Identify students who are in the top performance to determine support to accelerate or deepen learning.



#### 4.5.6 Teacher development reports

All five schools have programmes on teacher/staff development. They also have reported on the development of each staff member. The researcher analysed reports on mathematics teachers. Most of the teachers are attending developmental programmes at Penreach Centre at Nelspruit monthly on Saturdays. At the school level, they also develop each other when they have their committee meetings. The SMT members have their programmes to develop their teachers, with more focus on mathematics teachers. Teacher B3 said,

Our HODs have development programmes in place, we are developed in IQMS, and after class visits, they develop individual teachers who need developments on specific areas.

Principal B1 agreed with Teacher B3,

Teachers are developed in many ways at our school. Their HODs develop them at the departmental level. We also invite outside people on specific areas like 'Teamwork,' and I also encourage them to attend developmental centres like Penreach and also to register with institutions to study privately.

Curriculum; teaching methods, learners, resources are always changing, so teachers need to be developed now and then to be relevant to their learner's time, curriculum, and teaching methodologies. Machaba (2017), in agreement with (Principal B1) and (Teacher B3), highlights the following recommendations:

- Mathematics teachers need a deep understanding and knowledge of mathematics they teach to facilitate effective learning and development of children's skills.
- Mathematics teachers constantly need to improve their knowledge and skills of teaching mathematics to meet today's mathematics challenges.

Teaching is a life-long learning process. Teachers have to be willing to learn to adapt to new technology, new curriculum, and new methodologies so that they can be relevant to the modern world (par 2.7.2).

## **4.6 DATA ANALYSIS AND DELIBERATIONS ON RESEARCH FINDINGS.**

In this study, the data were collected by Microsoft teams and recording systems and was done to avoid the spread of the Covid-19 virus by contacting many people when conducting the interviews through face-to-face meetings. The University of South Africa did not permit the researcher to go to schools and conduct face-to-face interviews.

The responses were based on the research questions that focused on the factors that contribute to the intermediate phase's poor mathematics results; the characteristics of effective principals and principals' role in improving poor primary school results. The selected participants have a deep understanding and skills on how to improve mathematics' poor results.

Data analysis was based on the recorded responses and interpretations of the participants. After transcriptions of the recorded interviews, the following themes were derived:

- Why can principals contribute to poor mathematics results of intermediate phase in primary schools.
- Characteristics of an effective principal.
- Principals' management strategies and approaches to improve mathematics results.

These themes are related to the main research question: "The role of principals in managing the factors contributing to poor mathematics performance. The themes will be discussed using the direct quotations of the participants' recorded voices.

### **4.6.1 Factors that contribute to poor results of intermediate phase in primary schools**

Many factors influence poor mathematics performance in primary schools. Rural South African schools are the weakest in international assessment performance, and results from (TIMSS) show that pupils at rural public schools perform worse than their urban counterparts in languages, mathematics, and sciences (par. 2.6). All participants in this study, when asked whether there is a list of factors that influence their performance, they have mentioned factors such as lack of specialisation in mathematics, lack of resources, poor working conditions, the language of teaching

and learning, lack of parental involvement, poor leadership and management. I will firstly discuss the lack of specialisation in mathematics.

#### *4.6.1.1 The lack of specialisation in mathematics*

Most participants have raised a lack of specialisation in primary mathematics due to poor mathematics performance in primary schools in this study because primary school teachers are trained as generalists.

Principal A1 responded,

Poor performance in our school is influenced by lack of resources like shortage of classes, resulting in overcrowding, teachers who are not mathematics specialists, the influence of the community which is full of crime and care less about education.

Teacher B3 agreed with Principal A1 about subject specialisation and explained,

I am teaching mathematics in Grade 6, but I did Maths up to Grade 9 at the school level, and at college, it was compulsory, and I was struggling with it because there are no maths teachers, I am teaching it.

Deputy principal A2 agreed with the above statements and explained as follows,

All teachers teaching mathematics at our school were not trained specifically for mathematics teaching; they were trained to teach generally and is a challenge to maths teaching because mathematics has its language and concepts. Primary school teachers should be trained like high school teachers and that can also improve high school results.

A study conducted by Nkosi (2012) reveals that mathematics teaching in South Africa is in crisis. Fewer teachers with mathematics specialisation are found at high schools only, while at primary schools there is no specialisation, leading to very poor performance at primary rural schools.

Taylor, Van der Berg and Mabogoane (2013) found in The National School Effectiveness Study (NEES) that Grade 6 mathematics teachers have a low level of mathematics knowledge to teach the subject. Venkat and Spaul found in their study that the content knowledge of 79% of Grade 6 mathematics teachers was below the level required for learners to pass Grade 6 (par. 2.6.1).

Poor performance in our school is influenced by lack of resources like shortage of classes, resulting in overcrowding, teachers who are not mathematics specialists, the influence of the community which is full of crime and care less about education (Principal A1).

Most mathematics teachers are not specialised when they highlighted that, despite approximately 85% of mathematics educators being professionally qualified, only 50% have specialised in mathematics in their training (Makgato & Mji, 2006) (par. 2.6.2).

#### *4.6.1.2 The language of teaching and learning*

Another factor is the language of teaching and learning. In the foundation phase, the learners are taught in siSwati.

When they come to the intermediate phase, they change to English and is problematic because the mathematics concepts they learned as a foundation now have to change totally (Teacher B3).

Deputy principal C2 agreed with Teacher B3. Deputy principal C2 added,

Primary schools' language of teaching and learning is a problem in our schools because we lay the foundation in siSwati, where the learners start acquiring the mathematics' basic skills and concepts, and when they come to an intermediate phase in Grade 4, they change to English, and they have to start all over again. I wish the system can change so that we teach mathematics in English.

When they come to the intermediate phase, they change to English and is problematic because the mathematics concepts have to change totally. (Teacher B3)

Teachers have to teach in siSwati in the foundation phase because this is policy, but can reinforce the development of mathematics concepts in English. How I wish that English can be used from the foundation phase because that will support the continuation of learning in the other phases. (Principal B1)

Research has proved that there are challenges in mathematics performance because of the mathematics language (basic skills and concepts), developed and the transition in Grade 4, where five subjects are now taught in English. Furthermore, Burger (2014) concedes that the transition is more difficult for African language speakers because they learn in their mother tongue in the foundation phase and English from Grade 4 onwards (par. 1.1 and 2.6.3).

#### *4.6.1.3 The lack of parental involvement*

Lack of parental involvement contributes to learners' poor performance.

Principal C1 believes that lack of parent involvement has a major impact on learners' poor performance. Principal C1 explained,

Parents are not making any efforts in supporting their children's' education. When they are called for book viewing, few will attend, especially for those learners who do not have challenges, and some do not even check the assessment time tables we are sending home.

Teacher E3 agreed with Principal C1, sharing the same response when saying,

When we call parents to school, especially parents of learners with challenges, they do not come, we also give the learners books to check and sign, they do not respond, and they are not helping us.

Deputy D2 concurs with Principal C1 and Teacher E3 and added,

Parental involvement is a very big challenge in our area. Parents are not responding to the invitations we send to them; maybe it is because of the school's community; the members do not care about education. Parents' absence in their learners' education makes it difficult for the school to solve other learners' challenges because we have to teach them in totality. Sometimes they have social problems that require parents, which becomes difficult if they are not there.

Teacher A3 agreed with Principal C1, Teacher E3, and Deputy D2 and added,

Mathematics is a practical subject; it needs daily practice. We give learners home works to do at home, but they come back with work not done because parents are not supporting the school.

According to Gentry (2011:1), disengaged parents promote school failures and are helping create a generation of children who are less well educated than they are and may result in a lack of support to the learners by not providing resources, time management at home for homework and study, time to leave for school, and book viewing attendance (par. 2.6.4). Mashau, Kone and Mutshaeni (2014:54) confirm that parental involvement is very important in the education of their children, and point out that parents are educational stakeholders and need to ensure that their children get quality education by bringing valuable quality to the education experience because

they understand better and can influence time management, study habits eating practices, provide additional resources and encourage social Development by attending school functions and participating in decision making (par. 2.6.4).

#### *4.6.1.4 The implementation of the new curriculum*

Understanding and implementation of the new curriculum by teachers is another factor mentioned by the participants.

Teacher C3 responded,

The annual teaching plans (ATPs) are always changing, and we find it difficult as teachers to implement them thoroughly; what I have discovered is that there is more content to be covered than the time allocated. Exams start before we thoroughly complete the content and do revision with the learners, and this affects the pass rate of our learners.

Deputy principal E2 shared this view with Teacher C3,

The implementation of the CAPS is a challenge. In all the subjects, the content is more than the time allocation. There is always an outcry from teachers that they did not have enough time to revise with the learners or finish their topics. As for Mathematics, it needs more revision time, so this adds to its underperformance.

Principal B1 concurs with Teacher C3 and Deputy principal E2, highlighting,

The new curriculum and teaching methods are causing stress and confusion to teachers who are supposed to implement it, which affects learners' performance in mathematics. Teachers do not understand properly the curriculum itself and how to unpack it for the learners to understand. In most cases, when we analyse the results, they will always complain about the amount of work versus the time allocation. (Principal B1).

Paton (2011) confirms that official figures show that more than a quarter of mathematics teachers do not hold a relevant degree or postgraduate qualification in mathematics.

There are ever-changing systems of teaching and learning in South Africa, NCS (National Curriculum Statement), RNCS (Revised National Curriculum Statement), and CAPS (Curriculum and Assessment Policy Statement). Research has revealed that the implementation of the ever-changing curriculum is problematic to teachers

(par. 2.6.5). Du Plessis (2012:1, in Moodley 2013:32) viewed CAPS as an adjustment to what we teach (curriculum) and how we teach (teaching methods) and further explains that although there was positive support for the new curriculum (RNCS), there has been considerable criticism of various aspects of its implementation and resulted in teacher overloads, confusion, stressed learners who could not read or write and widespread learner underperformances in international and local assessments (par. 2.6.5).

#### *4.6.1.5 The attitude of mathematic teachers*

Another factor mentioned by the participants is the attitude of mathematics teachers and learners towards the subject.

Principal B1 highlighted the attitude of learners and said,

Learners believe in the mystery that says, 'mathematics is a difficult subject,' so this makes them enter the mathematics classroom with a negative attitude, believing that even if they learn and study mathematics, they will never perform better because it is 'difficult'.

Deputy C2 agreed with Principal B1 and explained,

Most teachers and learners believe that mathematics is a difficult subject, so teachers have a negative attitude and learners think they cannot pass mathematics easily.

A negative attitude fails; one cannot achieve anything if he has negative attitudes toward something. If teachers teach mathematics with a negative attitude, they will not do their best and will pass their negativity to the learners, and they will not be able to instil the knowledge to the learners. According to Kennedy L (2019), "Negative attitude appears to relate to poor performance.. Learners with a negative attitude will not understand what they are learning and will never pass the subject (par. 2.6.7). Principals' and teachers' attitudes impact their willingness to see the need to improve their mathematics and science teaching (par. 2.6.7).

Teachers' negative attitudes can affect mathematics performance in many ways. Marroquin (2018) maintains that teachers' attitudes can help or hurt students' motivation, achievement, and well-being and means that a learner can be motivated and perform very well if the teacher is positive towards mathematics; and can be de-

motivated and perform poorly if the teacher has a negative attitude towards mathematics.

#### **4.6.2 Characteristics of an effective principal**

For the schools to achieve good results, they need strong and effective management and leadership. The principals need to steer the performance based on their management and leadership styles. They must bear visions which they can transfer the schools' community. "Leadership is the capacity to translate vision into reality." (par. 2.5). Information from the selected participants has been considered by the researcher, and has developed the following themes:

##### *4.6.2.1 Principals' leadership styles*

There were different views from the participants when asked about their leadership styles. Principal B1 and Principal D1 mentioned that they use both the democratic and autocratic leadership styles. They emphasized that both styles are needed because they complement each other.

I use a democratic leadership style because I consider other peoples' views. I communicate decisions with staff members. I also consider the autocratic style because people are different; if they have too much freedom, other activities may not be done.

Principal B1 agreed with Principal D1 and explained,

I use both democratic and autocratic leadership styles. Autocratic is needed when I want to get things done and have due dates. I am also democratic because I consider other peoples' views and apply shared leadership.

Democratic leadership style involves the redistribution of authority and power between staff to provide employee involvement in decision-making (par. 2.5.2). Democratic leadership, which is also commonly known as participative leadership, is about letting multiple people participate in the decision-making process (Lee 2020).

Principal D1 and B1 responded, stating that they followed transformational and instructional leadership styles. They agreed with each other that transformational and instructional leaderships allowed people to work independently.



I can say that I am following both the transformational and instructional leadership styles because I make sure that the school's vision is clear and understood by everyone, then I ensure that the different groups at the school know what is expected of them. There are departments led by heads of departments (HODs) at our school, with manageable groups. In the foundation phase, there are two HODs; one is managing Grade R and Grade 1; the other HOD is managing Grade 2 and Grade 3. They report to the deputy principal. In the Intermediate and senior phase, we have two HODs, again. They manage a group of teachers and their subjects. The arrangement is that mathematics, social science, home language, and creative arts are managed by one of them, and first additional Language (English), Natural science & technology, economic and management sciences, life skills, and life orientation are controlled by the other HOD. (Principal A1)

I have subject committees at my school, including the mathematics committee. Each committee has its operational programme, aligning with the curriculum (CAPS) and the Annual Teaching Plan (ATP). The programme includes monthly meeting dates; analysis of results per term; set targets; planning and monitoring; improvement plans, and new strategies to improve. (Principal C1)

Principal C1, E1, and A1 used transformational leadership style because they inspire people to achieve good results and operate autonomously in committees, departments, and different groups and were in agreement with Folkman (2017), Henley (2019), Crockett (2018), and Comaford (2018) (par. 2.5.3)

Principal E1 agreed with Principal A1 and Principal C1; responding,

I practice transformational and instructional leadership style because there are different departments and phases at my school. An HOD heads each phase or department. The HODs have their programmes and schedules, which determine their operations. The programmes and schedules include departmental meetings, assessment programmes; curriculum monitoring; teacher development, class visits, moderation, book viewing, and teachers' motivation. Some of the activities are done by the heads of departments independently without involving the whole school, such as book viewing. They report to the deputy principal and the principal.

Building the SMT and driving a programme of in-school professional Development; promoting efficiency among teachers and learners in the language of teaching and learning; more effective use of time and importance of the role of assessment. Instructional leadership is needed to improve performance, build a vision, establish a

shared leadership model, lead and use data, and monitor curriculum and instruction. (par. 2.5.4)

Teacher E3 responded,

Our principal is an instructional leader because she ensured that everyone understands her vision about the school. Above that, she acknowledged other colleagues' views; she has programmes to monitor the curriculum and gives clear instructions to everyone.

Deputy A2 agreed with Teacher E3,

Instructional leadership is followed by the principal because all school stakeholders are working towards achieving the school principal's vision, the parents, teachers, learners, and support staff. The principal allows every leader to operate independently, departmentally, or in a certain committee, but report to each other in different orders, so he allows a shared leadership model.

Sheninger (2016) agrees with (Teacher E3) and (Deputy A2) when stating that instructional leadership is building a vision, establishing a shared leadership model, leading and using data. Successful principals have visions, and they share their visions with everyone at the school because everybody has to work towards accomplishing that vision. Principals that develop leaders and allow sharing in leadership make sure that reporting and accountability are strengthened and use data to analyse performance, results, nutrition, finances, projects, cleanliness, and many organization areas (par. 2.5.4).

Ultimately, distributed leadership is about giving leaders in schools ownership by empowering them to lead their teams and drive forward their strategies that contribute towards the whole school priorities. (Solly, 2018)

#### *4.6.2.2 Role of principals in managing poor mathematics performance*

Principals are the key role players in the management of poor mathematics performance at schools. The authorities and education stakeholders are looking up to them to remedy any situation at their institutions. They have to implement their management knowledge to get everyone on board to help implement the strategies to improve the results. They have to employ their leadership skills (par. 2.5) and management principles. Management includes implementing school improvement

strategies, implementing incentive structures for teachers and support personnel, recruiting and evaluating teachers, brokering professional development strategy, allocating school resources toward instruction, and buffering non-instructional issues from teachers (par. 1.1).

Math teachers in Mpumalanga may also consider the national development plan strategies, which suggests strengthening leadership in our schools; having sound and applicable policies; having skilled managers and employees; clear lines of accountability; putting all systems in place and consistent and fair applications of rules to everyone in the school community.

This study acknowledged staff development by the principal as another strategy for results improvement. Principals are stewards of learning who value learning and commit themselves to it in their daily work, and they understand the connections between teacher professional development, student learning, and school quality (par. 2.7.2).

Principal A1 and E1 agree, stating the following,

At the school, we have staff development programmes, departmentally, in committees, and at the school level. Mathematics teachers develop each other at the subject committee level. There are also workshops at the circuit level; teachers attend once per term to look at the term content. As a principal, I also encourage them to register with developmental centres around our area, like Penreach. I also encourage them to enrol with higher institutions to gain more knowledge and to be well equipped with the changing curriculum and the changing methods and the use of technology.

Principal E1 added,

Mathematics is developed by their colleagues, their HODs, and curriculum implementers. There are developmental programmes at the school which operate in different levels, at the committee level, departmental level by HODs, and circuit levels by the curriculum implementers(CIs). I also encourage them to participate in professional bodies like AMESA (Association for Mathematics Education of South Africa)(par. 2.7.8).

Some of the importance of joining professional bodies are networking with fellow educators, opportunities for research, leadership skills improvement and practice,

access to specific grants, fellowships, and awards and prioritization of growth as an educator (National Society of High School Scholars, 2019).

Primary school mathematics teachers are not subject specialists, and primary school teachers' mathematics abilities are a problem experienced in many countries, including the US and the UK, but particularly in South Africa where mathematics specialists are appointed at high schools and primary teachers are trained generalists (par. 2.6.2).

Teacher C3 explained,

We have in-service training as mathematics teachers where we attend subject content workshops every term conducted by the department, and we also attend content workshops at Penreach college, which are conducted by the curriculum implementers. (Teacher C3)

Teacher E3 agreed with Teacher C3 that they are workshopped to improve their skills in mathematics subjects. When asked how the principal pioneer teacher development at their school, Teacher E3 responded,

The principal encouraged us to register with teacher development centres like Penreach, professional bodies like AMESA, and encourage us to workshop each other at the school level and to attend cluster workshops at the circuit level.

Shay (2020) believes that teachers' poor mathematics knowledge influences mathematics results in South Africa. Mathematics teachers have to be developed continuously, especially primary school mathematics teachers because they are not subject specialists; they are trained as generalists.

Leaders need to increase the capacity of newly qualified educators. Newly qualified educators need induction from experienced colleagues. Teachers require training to implement the curriculum effectively (par. 2.7.3). Principals are stewards of learning, who value learning and commit themselves to it in their daily work. They understand the connections between teacher professional development, student learning, and school quality (par. 2.7.2).

Principal E1 explained,

Our newly qualified teachers are attached to experienced educators according to the subjects they are to offer. The teachers induct them on how to do the planning,

introducing a lesson, engaging learners in a lesson, selection of activities, managing a class, and many other dynamics of teaching and learning.

The findings and recommendations by the NEEDU suggest that if the principal and the management team are strong and well- skilled, school results can improve (par. 2.6.7).

Education is a learning cycle without an end. It is not going to stop after graduation and starting a career. Continuing education helps career-minded individuals to continually improve their skills and become more professional at their work. (Events, 2020)

Principal D1 and Principal E1 agreed that staff development was an important tool to improve learners' results because teachers would become better with relevant knowledge. Principal D1 explained,

The department has continuous workshops to develop teachers, according to specific subjects. They attend workshops and register with different institutions and the departments pay for their studies. We also organise workshops and invite outside people to develop our teachers.

Principal E1 added,

The Department of Education in Mpumalanga has partnered with different institutions for teacher development like Penreach Centre, where teachers attend workshops according to their subjects every month, and teachers are also encouraged to register with institutions of higher learning to develop themselves.

Cassidy (2020) states that education is a never-ending process. It does not stop after earning a degree and starting a career. Through continuing education, career-minded individuals can constantly improve their skills and become more proficient at their jobs (par. 2.7.2 and 2.7.3).

Mathematics results can be improved if our principals are 'hands-on 'on what we are doing in class. They must put working systems in place by monitoring the HODs programmes thoroughly and developing all the leaders to ensure accountability. (Teacher A3)

Deputy D2 agreed with Teacher A3 and responded,

The SMT should be well developed, know exactly what their roles are as managers and leaders. They must ensure that the school operates as one entity with

workable systems in place, working policies which are understood by everyone, give clear tasks to members of which they will be accountable for.

The SMT is the steering committee and the highest decision-making body at the school. If they are not clear about their job description, they may not take the school anywhere. Like the times, systems, curriculum, methods are changing; they have to continuously develop to be in-line with what is happening around them. They can participate in professional bodies like AMESA and SAPA (par. 2.7.8).

Heads of departments also need to be continuously developed because of the changing world and also that they are not specialists in their field of operation as managers of phases, other than in high schools where a HOD is managing a group of teachers who are teaching the subject in which the HOD is a specialist (par. 2.7.3). Leaders need to ensure organisational functionality; management may apply the administrative management theory developed by Henry Fayol in 1916, including forecasting, planning, organising, commanding, coordinating, and monitoring (par. 2.4.1).

#### **4.6.3 Principals' strategies and approaches to improve mathematics results**

The principals and deputy principals were interviewed about strategies and approaches they could implement to improve their mathematics performance, and they mentioned different strategies.

The following are some of the strategies they came up with during the interviews:

##### *4.6.3.1 Recruitment of mathematics teachers*

This study suggested that principals can play an effective role in the Recruitment of mathematics teachers. Principals can grow their teachers; form partnerships with higher education institutions, create alternative routes; offer incentives to attract high-quality maths teachers to rural schools; streamline the hiring process, improve the working conditions and provide support for mathematics teachers. (2.7.1.1). Principal D1 agreed and stated the following,

To get mathematics teachers, I always input on the process of employing new teachers by adding mathematics qualification as a requirement for the new posts.  
(Principal D1)

The Mpumalanga Department of Education has a bursary scheme recruitment strategy called Funza Lushaka, which supports teachers' studies. The Funza Lushaka Programme is a multi-year programme to promote teaching as a profession (e-Gov. portal, 2021). Many teachers are attracted, whether they come in as job seekers or have a love for the profession, that needs to be researched. Van der Berg *et al.* (2011) confirm that "bursaries alone will not attract enough to-achieving candidates into teaching and are powerless to retain good teachers" (2.7.1)

#### 4.6.3.2 *New ways of teaching*

In this study, new teaching methods have been recognised as a strategy to improve mathematics performance. Team planning and usage of technology result in an effective lesson. According to Fitzell (2016), team teaching creates effective, fun learning; teachers can use their knowledge effectively together; allows for shared ideas, and breaks the monotony of one person doing all instruction (par. 2.7.4).

Teacher A3 and Deputy C2 agreed that teamwork is a working strategy. They stated,

At our school, we plan together per grade and subject. Planning helps us produce effective lessons because we share ideas, and in the process, we develop each other. This also helps when a teacher is absent; those at school can continue with the lesson without any problem

Deputy C2 concurred with Teacher A3, stating,

Teachers at our school do their planning together. In the foundation phase, subject teachers from Grades 4 to 7 per grade. This helps in that powerful and usable lesson plans are developed; teacher challenges are being addressed as they work together, and they teach each other how to use new technology.

Teacher B3, when asked about the usage of technology at their school, responded,

We have a 'maths lab' at our school, it is user friendly and is enjoyed by all learners because they understand the usage of computers more than us.

Only one school has mentioned that they only use technology to search for information from the internet from all the participating schools. The other three schools also have smartboards, and one school has been provided with a 'mathematics lab.

The usage of new technological resources can impact the improvement of resources. With the increase of technology, students and teachers can take

advantage of these on their tablets, computers and smart boards. Virtual and concrete manipulative reinforce mathematical concepts separately but a combination of both is the best way to achieve the best results. (Burns & Hamm 2011)

The three schools with smartboards may not be able to use them, and the one with maths lab effectively. Teachers need to be developed to be able to use technology in their teaching (par. 2.6.8). An effective integration of technology in the classroom is hard for some educators. They have to understand content, teaching and technology on nearly equal terms, and when one does not, it all has an awkward way of illuminating the holes in the teachers' expertise (Heick 2015).

#### *4.6.3.3 Encourage parental involvement*

Parent involvement is regarded as a useful tool or strategy in supporting the learning and improving mathematics results, and both students and schools benefit when parents are involved in education (par. 2.7.5).

All participants in this study have mentioned parent involvement as a strategy to improve mathematics results. Principal D1 highlighted the following,

Parent involvement is another tool that can help us improve mathematics results. If parents could be 'hands-on' in checking daily activities, homework, and support their children with require resources, they will know how their children perform. They will also be able to check the learners' assessment programme and help them to prepare for tests and exams.

Deputy A2 agreed with Principal D1, stating,

Parents are important stakeholders in the education and learning of their children. If parents are missing, the teaching and learning will be incomplete. We need parents to work with us in monitoring the home works we give to learners, to encourage them to study, even to check whether they have written their work, and to help the learners study for tests and examinations.

When asked for any other strategies that they can be added to support the study, Teacher D3, Deputy E2, and Principal E1 added,

Other strategies could be, building staff morale, because teachers are no more encouraged to do their work, they have a lot of work, and they are not appreciated,



learners have a negative attitude towards mathematics, and their managers are also stressed

Deputy E2 added,

Language of teaching and learning changes could be made using English as a medium of instruction from Grade R in mathematics. This could help a lot on concept building because in our schools, siSwati is used in the foundation phase, and the transition is done in Grade 4. The learners have to change all the concepts from SiSwati to English in Grade 4, for example, *calantsatfu* for 'triangle'.

Principal E1 added in agreement with the above participants,

Other strategies could be, provision of technological resources in all school by the Department, hiring of specialized teachers even in primary schools, limiting the number of learners in the classrooms, changing the language of teaching and learning to English, the addition of teachers and motivation of teachers by improving their salaries. This can improve performance.

Language of teaching and learning is key in learners' performance because they have to understand what they are learning through language; a language builds concepts. The foundation needs to be stronger to be able to build on it. Berger (2014) concedes that the transition is more difficult for African language speakers because they learn in their mother tongue in the foundation phase and in English from Grade 4 onwards. There should be a link between the foundation phase learning of mathematics and the intermediate and senior phases. The concepts laid in the foundation phase should be reinforced in the following phases (par. 2.6.3).

#### **4.7 CONCLUSION**

This chapter presented an analysis of the data collected from the interviews. Themes and sub-themes presented the data. The selected participants shared their experiences and insightful information that may serve as guidelines to establish management strategies and approaches to improve mathematics performance in primary schools.

The following three main themes derived from this study are:

Theme 1: Factors that contribute to poor mathematics results of intermediate phase in primary schools.

Sub-theme 1: List of factors that contribute to mathematics poor performance.

Theme 2: Characteristics of an effective principal.

Sub-theme 1: Leadership styles of principals

Sub-theme 2: Role of principals and deputy principals in managing factors that influence mathematics performance.

Theme 3: Principals' management strategies and approaches to improve mathematics results.

Sub-theme1: Recruitment of mathematics teachers.

Sub-theme 2: New ways of teaching

Sub-theme 3: Encouraging parent involvement

The above themes were discussed in detail to find meaningful strategies to improve mathematics performance. All the participants contributed significantly to identify management strategies that can help improve mathematics results in primary schools.

The following chapter will discuss the plan for mathematics results improvement. This will be discussed in the final chapter of this dissertation and will consolidate this study's findings. This will be the summary of this study and will focus on the recommendations.

# **CHAPTER FIVE: SUMMARY, FINDINGS AND RECOMMENDATIONS**

## **5.1 INTRODUCTION**

Chapter five of this study will present the summary, findings, and recommendations based on my study. The findings and recommendations are based on the sub-research questions and objectives of my study. The study's main aim was to establish exactly by research the various stakeholders' perceptions regarding the management strategies and approaches applied by successful school principals to improve Mathematics results at Ehlanzeni district primary schools in Mpumalanga province.

The study focused on the following sub-questions:

- What are the characteristics of an effective principal?
- Why can principals contribute to the poor mathematics results in the intermediate phase at primary schools?
- What are the principals' management strategies and approaches to improve mathematics results?

This chapter also acknowledges the limitations of the study and provides different approaches to furthering the research.

## **5.2 SUMMARY OF THE STUDY**

The summary deals with the essential aspects of my study discussed in Chapters 1, 2, 3 and 4. Chapter 1 focused on the introduction and background. Chapter 2 was a literature review that looked deeply at the conceptual framework, a foundation for the study. Chapter 3 focused on the research design and the methodology, and Chapter 4 concentrated on the data analysis and the discussions of the research findings.

### **5.2.1 Key aspects related to the introduction and background of the study**

Chapter one lays out the introduction and the background of the study. It demonstrated that primary schools perform poorly in mathematics, an ongoing problem in South Africa (par. 1.1). Primary schools in Mpumalanga are also underperforming in mathematics. This study was conducted to find out strategies and approaches to improve mathematics performance. That will serve as a guideline for principals to

improve the results, which forms the rationale for this study (par. 1.2). From the discussions and information laid out in the rationale and the problem statement, the research question was established: What is the role of principals in improving Grade 6 performance in mathematics in Mpumalanga? (par. 1.3). The study's objectives highlight the factors that contribute to poor, intermediate phase mathematics performance and how stakeholders, especially principals, can manage these factors (par. 1.4). A brief research methodology is also outlined; a qualitative research design was used in my study (par. 1.6.1) and was discussed in Chapter 3 in more detail (par. 3.3.1). This study's population consisted of the twenty-eight (28) primary schools in the White-Hazy circuit at Ehlanzeni District, Mpumalanga. This chapter also discusses sampling, which is formed by the selected five performing primary schools, their five principals, five deputy principals, and five Grade 6 mathematics teachers (par. 1.6.3).

The literature review is discussed briefly in this chapter, which established the difficulties that school principals face in managing poor mathematics results of the intermediate phase and the formulation of interview questions on the strategies they can use to improve mathematics (par. 1.6.4). Data analysis and interpretation were also discussed in this chapter. Data were arranged into manageable themes and sub-themes. The researcher coded the data and grouped them into categories (par. 1.6.5). This chapter further explored the study's credibility and trustworthiness. Different methods were used, like interviews and document analysis. Different participants were asked the same questions to encourage a variety of responses. Documents like minutes of meetings, teacher development programmes, assessment programmes, and summaries of results for five years were analysed to ensure credibility and trustworthiness (par. 1.7).

Research ethics are also discussed in this chapter, permission to conduct research, ensuring informed consent, confidentiality, anonymity, and protection of human rights (par. 1.8) and the limitations and delimitations of the study was also discussed where only five schools, five principals, five deputy principals, and five teachers were selected for this study (par. 1.9).

### **5.2.2 Literature review**

Chapter 2 of this study represented a literature review, which formed a basis for my study, which focused on the factors influencing learner performance in mathematics

and improving strategies. Important different facets of this chapter were discussed. The mathematics performance was discussed because it focused on the principal's role in improving mathematics in primary schools and mathematics underperformance in Mpumalanga (par. 2.2).

The status of how South African primary schools perform in mathematics was also discussed (par. 2.3). A theoretical framework that outlined the principals' leadership styles and characteristics of effective principals related to school results was discussed (par. 2.4). Management theory that could be applied by school managers to improve performance is also discussed in this chapter (par. 2.4.1). Different leadership styles of principals are also discussed in this chapter to check, which is the best in improving mathematics results (par. 2.5).

Different factors that influence learner performance in mathematics were discussed in this chapter, which includes lack of proper mathematics basic skills, teachers' lack of specialisation in mathematics, challenges with the language of teaching and learning, lack of parental involvement, implementation of the new curriculum, attitude of teachers and learners and the lack of knowledge in the usage of technology (par. 2.6). This chapter also outlined the strategies and approaches that principals could use to improve mathematics performance and serve as guidelines for Mpumalanga principals (par. 2.7).

### **5.2.3 Research design and research methodology**

Chapter three discussed the research design and the research methodology of this study. A qualitative research approach is used, and it is relevant for my study because it is more concerned with understanding a social phenomenon, that is, how mathematics results can be improved by the principals (par. 3.3.1). The interpretive paradigm is used for my study because the researcher could view the research problem through the participants' eyes, analyse, and interpret data as research findings were based on their experiences (par. 3.3.2). Purposeful sampling was used to select five well-performing primary schools, five principals, five deputy principals, and five Grade 6 mathematics teachers from the same schools (par. 3.4).

Data collection approaches included individual interviews conducted online through Microsoft Zoom. Face-to-face individual interviews were not allowed by the University

to prevent the spread of Covid-19 (par. 3.5.1) and document analysis (par. 3.5.2). The documents were emailed to the researcher due to the Covid-19 restrictions. The researcher was prohibited from going to the schools and collecting documents to ensure participants and the researcher's safety. The observation method was not used to collect data because South Africa was in lockdown due to the Covid-19 pandemic (3.5.3). Data analysis and interpretation were discussed. Data were analysed and interpreted inductively to identify themes and categories by analysing documents and conducting interviews (par. 3.6).

In this chapter, trustworthiness was discussed to support the relevancy of the strategies for improving mathematics results to other primary schools facing the same challenges that affect mathematics performance (par. 3.7). Trustworthiness methods included credibility, where the researcher asked similar questions to different participants to allow for different perspectives from the responses (3.7.1). Confirmability because the researcher did not reveal any opinions on the findings and participants' responses. (par. 3.7.2). Dependability is the extent to which other researchers could repeat the study to ensure that the findings are consistent. This study has been continuously reviewed and examined by an outside person to ensure that the findings are consistent and repeated. The study will also be documented and registered under research articles for other researchers to use and continue with it in the future (par. 3.7.3). Transferability, because the findings apply to other contexts, as all schools are concerned with learners' performance; is headed by the principals; curriculum heads are deputy principals, and mathematics in primary schools are taught by generalist teachers (par. 3.7.4).

Ethical considerations were discussed because it is required when the research involves human beings (par. 3.8). Ethical considerations include ensuring informed consent, the researcher emailed written information, outlining the purpose and procedures of the study on the consent form, and the participants consented and signed them (par. 3.8.1). Voluntary participation, participants were given a clause on the consent forms that they may withdraw participation without any required explanations or justifications for their decisions and actions (par. 3.8.2). The protected the human rights of the participants as stipulated in the Bill of rights, like the right to privacy, the freedom to withdraw, the right not to be harmed in any way (par. 3.8.3), and the right to anonymity and confidentiality. The researcher informed and ensured

the participants that the information gathered was only for study purposes and will never be disclosed to anybody or authority outside the study. The schools and participants were coded for anonymity (par. 3.8.4). The limitations of this study are discussed in chapter three (par. 3.9).

#### **5.2.4 Data analysis and interpretation**

Chapter four outlined the findings from the data collected by online Microsoft zoom and analysis of documents. Firstly, a brief description of the Mpumalanga Ehlanzeni district, White-Hazy circuit, primary schools, and population type were discussed (par. 4.1). A brief description of the selected primary schools, principals, deputy principals, and Grade 6 mathematics teachers was given (par. 4.3). Data findings from document analysis were discussed (par. 4.5), which included school results for the past five years (par. 4.5.1), school improvement plans (par. 4.5.2), minutes for the mathematics committee (par. 4.5.3), minutes of the SMT on the analysis of results (par. 4.5.4), minutes of staff on the analysis of results (par. 4.5.5), teacher development reports (par. 4.5.6) were discussed. Data from the individual online interviews were discussed in detail, based on the three main themes and sub-themes (par. 4.6). These findings are the crucial aspects of the study, where the participants put forward their original responses to the factors that influence mathematics performance and the suggested strategies to improve mathematics results. Literature was also included in the discussions as a requirement for verified findings.

### **5.3 FINDINGS FROM THE RESEARCH STUDY**

This study's findings will be discussed based on the three sub-questions stated above (par. 5.1). The findings are related to the participants' opinions and extensive knowledge concerning the improvement of schools' mathematics performance.

#### **5.3.1 Findings regarding sub-question one: What are the factors that contribute to poor mathematics results of intermediate phase in primary schools?**

The different participants' responses clarify that they are all concerned with good mathematics performance at their schools. The study reveals that there are factors that hamper good performance in mathematics results. The study showed that the principals have a very big task to deal with the following factors: Lack of teacher

specialisation and skills in mathematics; the language of teaching and learning; parental involvement in school's activities; leadership and management styles; difficulty in the Implementation of curriculum and the attitudes of teachers and learners (par. 4.6.1).

#### *5.3.1.1 Lack of teacher specialisation*

According to all the participants' responses, one of the major factors contributing to poor mathematics results is teacher specialisation in mathematics (par. 4.6.1.1). Primary school teachers are trained as generalists, meaning they can teach all primary school subjects; therefore, there are no mathematics specialists in primary schools. Research has also shown that teachers teaching mathematics in primary schools have a low level of content knowledge (par. 2.6.1) and are not specialised in the subject (par. 2.6.2).

#### *5.3.1.2 Language of teaching and learning*

The study's findings also revealed that another factor contributing to poor mathematics results is the language of teaching and learning. The participants have raised that in the foundation phase, learners are taught in their mother tongue; in our area, they are taught in siSwati, and when they continue to the intermediate phase, in Grade 4, they change to English. This transition is a challenge because the basic skills and concepts they acquired in the foundation phase have to change totally (par. 4.6.1.2). Research has proved that the transition is difficult for African language speakers. (par. 2.6.3).

#### *5.3.1.3 Lack of parental involvement*

Another factor contributing to the poor performance of mathematics mentioned by all the participants is the lack of parent involvement. The study findings revealed that parents are not responding properly in all the schools towards meetings, book-viewing, extra-mural activities, and when called individually for learner challenges, especially the parents of learners who need support (par. 4.6.1.3).

Research has shown that the disengagement of parents promotes school failures (par. 2.6.4), but parental involvement as educational stakeholders can support the performance of schools because they can influence time management, study habits, provide additional resources and encourage social development by attending school functions and participate in decision making (par. 2.6.4). The study's findings support



the research findings because it revealed that when parents are involved in their children's' learning, they can help the school monitor homework classwork and check assessment programmes to study for tests and exams (par. 4.6.3.3).

#### *5.3.1.4 Implementation of the new curriculum*

Another factor mentioned by all the participants in the challenge faced by teachers in implementing the new curriculum. The study findings revealed that teachers challenge the ATPs' amount of work concerning the time allocated for mathematics content. Mathematics needs more time for revision, but there is a lot to be covered.

The research revealed that the ever-changing systems of teaching and learning in South Africa has a considerable criticism of various aspects of its Implementation and resulted in teacher overloads, confusion, stressed learners who could not read nor write, and widespread learner underperformances in international and local assessments (par. 2.6.5). The ever-changing curriculum also makes it difficult for the mathematics teachers to understand it to unpack for learners. It is also highlighted that the amount of work to be covered by the teachers is more than the time allocated, which is a burden because they are not subject specialists (par. 4.6.1.4).

The participants also highlighted the participants' attitude and learners to contribute to poor mathematics performance. The research revealed that learners with a negative attitude towards mathematics will not understand what they are learning and will never pass the subject. Teachers' attitudes impact their willingness to see the need to improve their mathematics teaching (par. 2.6.7). The study findings showed that learners believe that mathematics is a very difficult subject, resulting in them failing the subject. Teachers who teach mathematics with a negative attitude do not motivate them and make them believe it is difficult (par. 4.6.1.5).

#### **5.3.2 Findings regarding sub-question two: What are the characteristics of an effective principal?**

The findings in this section of the study will be based on an effective principal's characteristics, focusing on leadership styles and roles and improving mathematics performance.

### *5.3.2.1 Principals as transformational and instructional leaders*

The participant's responses revealed that an effective principal could promote an improvement in school results. The principal should steer the performance based on their management and leadership styles (par. 4.6.2). Research supported these findings by revealing that principals must bear a vision and must have the capacity to translate it into reality (par. 2.5). The findings from this study pointed out that for the principals to be successful and effective in their management and leadership, they have to follow certain leadership styles to help them achieve their goals and fulfil their visions (par. 4.6.2.1). The study findings revealed that most participants followed the transformational and instructional leadership styles. They all mentioned that they made sure that everyone understands the school's vision, and all stakeholders work toward achieving the principals' vision. The school management team (SMT) manages the curriculum and works towards improving performance, and reports to the principal. Teachers are responsible for teaching the learners effectively to improve performance and report to the HODs. School governing body (SGB) responsible for governing the school to support performance. The support staff is also working towards the principals' vision to improve performance; the cleaners keep the school clean for the environment to be conducive for learning; the kitchen staff cooking for learners to have the energy to concentrate and learn to improve the results. The learners know that they are there to learn and achieve good results; that is why they are supported in every way. Research has revealed that an instructional leader builds a vision, establish a shared leadership model, lead and use data, monitor curriculum, and gives clear instruction (2.5.4). The findings presented key leadership elements that could improve mathematics performance, such as stakeholders' involvement, clear vision, functional operational programmes, data usage, curriculum monitoring, teamwork or spirit, and openness. The principals allow every leader to operate independently, departmentally, in certain committees, as a shared leadership model is employed, but reporting is done to maintain operational order (par. 4.6.2.1.).

### *5.3.2.2 Effective principals have staff development programmes*

My study's findings also revealed that the principals' role in staff development is important for improving mathematics performance. Principals are stewards of learning who value learning and understand the connections between teacher professional

development, student learning, and quality performance (par. 2.7.2). According to my study's findings, successful principals have developmental programmes at all levels, school, departmentally, and in different committees (par. 4.6.2.1).

Principals also encourage mathematics teachers to attend mathematics cluster meetings at the circuit level, where mathematics teachers per Grade meet quarterly to discuss the term content and help each other with teaching methods. The principals also register their teachers at developmental centres like Penreach college, where they attend monthly to discuss subject content, challenges, and teaching methodology (4.6.2.2).

Mathematics teachers are also encouraged to register with professional bodies like AMESA (Association for Mathematics Education of South Africa)(par. 2.7.8). Research findings also clarify that teachers need development and management teams to manage their phases effectively because they are also not specialists in mathematics. Primary school HODs are heading phases, there is an HOD for foundation phase (Grade R to Grade 3) with three to four subjects, an intermediate phase HOD is (Grades 4 to 6 or 7). Grades 4 to 6 has six subjects and Grade 7 offers 9 subjects. A primary school might have one or two HODs for the intermediate and senior phase, depending on the size of the school. One HOD has to work with all the teachers and monitor all the subjects of which some of them they might not even understand because they are not specialists (par. 2.7.3).

### **5.3.3 Findings regarding sub-question three: What are the principals' management strategies and approaches to improve mathematics results?**

My study's main purpose is to propose strategies and approaches that might serve as guidelines to improve mathematics performance in primary schools. Principals and deputy principals are the key role players in managing the factors that influence poor performance (par. 4.6.3). I will explain some of the strategies which principals and deputy principals might implement to improve the poor performance in mathematics.

#### *5.3.3.1 Recruitment of mathematics teachers*

My study's findings suggest that one of the main strategies is the recruitment of mathematics teachers; since primary school teachers are not specialist, the principals

can improve their teachers by nurturing mathematics students towards the qualification, form partnerships with higher institutions to get qualified teachers, streamline the hiring process by adding mathematics qualification as a requirement for an appointment and improve working conditions for mathematics teachers (par. 2.7.1.1). The research revealed that bursaries alone would not attract and retain good teachers, so principals have to come in and provide support for mathematics teachers to stay in the profession (par. 4.6.3.1).

#### *5.3.3.2 New way of teaching*

Another strategy from the study findings is to apply new teaching methods, including team planning, team teaching, and technology usage. Most participants responded that they use team planning and team teaching for the improvement of mathematics performance. They further explained that team planning produces effective lessons because mathematics teachers share ideas, and in the process, they develop each other, and mathematics challenges are being addressed (par. 4.6.3.2). Research has shown that team teaching creates effective, fun learning. Teachers use their knowledge effectively, allows for shared ideas, and breaks the monotony of one person doing all the instructions (par. 2.7.4). The research finding also revealed that some schools have 'maths labs,' new development in mathematics teaching. When teachers are working together, they can develop each other to use new technology in their lessons (par. 2.6.8). Mathematics performance may also be improved by providing technological resources in all schools by the Department of Education, training of teachers on how to use them, and the changing of language of teaching and learning to English from Grade R to Grade 3 (par. 4.6.3.3).

#### *5.3.3.3 Parental involvement*

Another strategy listed in my research findings by all participants is the encouragement of parental involvement. Parent involvement by the principals is regarded as a useful strategy in the improvement of mathematics results because parents are important stakeholders in education; they are always with the learners, they can help with homework, check the learners' books, timetables for tests, and exams (par. 4.6.3.3).

## **5.4 RECOMMENDATIONS**

My study's main aim was to discover numerous and diverse management strategies and approaches that principal can implement to improve primary schools' mathematics performance in Mpumalanga province. The researcher based the recommendations on the literature review and practical experiences. The findings in this study may be used to develop strategies to improve mathematics results by the principals.

### **5.4.1 Recommendations with regard to research objective one**

Research objective one was to determine different factors that influence poor mathematics performance in primary schools and make recommendations from the research study's findings. All selected participants have made a major contribution to the recommendations to improve mathematics performance, based on the different factors that hamper performance.

#### *5.4.1.1 Support to HODs*

One of the factors that impede mathematics performance in primary schools' performance is the lack of teachers' specialisation in mathematics. The study has shown that mathematics teachers in primary schools have little knowledge of the subject because they are trained as generalists (par. 4.6.1.1). The HODs should also be trained specifically for the subject so that they can be able to support the teachers and monitor the content that they deliver to the children under their supervision. To be relevant, computer literacy should be compulsory for teacher training, and mathematics programmes should be installed in the computers for teachers to use. Those who are already in the field should be encouraged to enrol in mathematics and study further as mathematics specialists, and the Department must pay for these studies. A developmental programme for mathematics HODs' cluster is recommended at the circuit level where HODs are equipped with mathematics knowledge and management. HODs' cluster meetings may serve as a developmental activity and may build confidence in HODs' work. In their annual plan, the district can include an educator development programme so that the circuit and schools may develop theirs as they always develop their programmes from the district one. These programmes will improve on the expertise of HODs, which will in turn improve mathematics performance in primary schools.

#### *5.4.1.2 Language of teaching and learning*

Another factor discovered in the study is the language of teaching and learning. The use of mother-tongue in the foundation phase and the transition to English in the intermediate phase impede mathematics performance because mathematics has its concepts and skills needed to build as learners proceed to the intermediate phase. The mathematics skills include addition, subtraction, multiplication, and division, and the concepts such as the naming of shapes, e.g. a triangle are *calantsatfu* in siSwati in the foundation phase, and there is no relation of the concept in the intermediate phase, it becomes a new word in Grade 4, which is a 'triangle' (4.6.1.2). I want to recommend that English be used as a language of instruction to teach and learn mathematics from the foundation phase because the foundation phase is preparing for the intermediate phase to build on it, not crush the foundation and start a new thing.

The findings revealed that the Department of Education needs to restructure the system of languages in primary schools because there are two languages of teaching and learning. I want to recommend that the Department of Education allows for English to be used as a language of teaching and learning from the foundation phase, especially for mathematics teaching. This could help a great deal in concept building and skill development, which might improve mathematics performance in rural primary schools.

#### *5.4.1.3 Parental involvement*

Another factor from the research findings, which results in the poor performance of mathematics, is the lack of parental involvement in learners' education. Research has revealed that disengaged parents promote school failures (4.6.1.3). Principals have to come up with ways of attracting parents to schools. They may check for days and times convenient for all parents to attend meetings by taking decisions together. Schools can also improve the communication mode using letters and cell phones (calls, messages, what's up messages, and emails). They may also be cautious about when they are busy with their meetings; they should make sure that they stick to the agendas and make the meetings as short as possible.

#### *5.4.1.4 Implementation of the new curriculum*

Another factor is the challenges in implementing the new curriculum faced by mathematics teachers (4.6.1.4). The ever-changing systems and methodologies leave teachers with confusion, stress, and work overload, resulting in poor performances in mathematics. The Department of Education, curriculum developers, in consultation with the teacher representatives, should restructure the content knowledge concerning the annual teaching plans and time allocation. I recommend that the school, circuit, and district work together to arrange important content to be taught. The schools, circuits and the district may work together to alleviate the stress and confusion caused by the new system of teaching to teachers. As mentioned that in most cases, teachers are not clear on the content, the circuit need to re-enforce the cluster meetings and make sure that they are functional and fruitful. The district must demand reports from the circuits and schools. Secondly, the ATPs should be discussed with the mathematics teachers before the beginning of the school calendar to ensure understanding and the percentages of work per topic.

#### *5.4.1.5 Attitude of teachers*

Another factor mentioned is the attitude of teachers towards mathematics. Teachers perceive mathematics as a 'difficult' subject. The negative attitude influences the performance of mathematics. Research has shown that teachers' attitudes negatively impact the improvement of the teaching of mathematics (par. 4.6.1.5). To deal with teachers' attitudes towards mathematics, principals may motivate teachers to register with mathematics professional bodies like (Association for Mathematics Education of South Africa) AMESA, where teachers are skilled in mathematics teaching. They could also motivate teachers to work together in groups when preparing mathematics lessons and do team teaching. Planning and teaching together can assist teachers in being confident about teaching mathematics. Principals may also direct more funds during budgets towards purchasing some technological resources.

### **5.4.2 Recommendations with regard to research objective two**

#### *5.4.2.1 Principals as transformational and instructional leaders*

Research objective two was to describe the characteristics of effective principals. The study clarifies that for a school to have excellent results, it needs an effective principal.

Effective principals must bear visions that they must be able to transfer to the school community. Principals must follow leadership styles that will make them able to work with every education stakeholder effectively. The findings have revealed that the effective principals are using transformational and instructional leadership styles because all stakeholders understand their visions, operate independently, which is shared leadership model, in their departments and committees, have programmes to monitor curriculum, promote continuous reporting, use data when analysing results and they give clear instructions to everyone (4.6.2.1). I recommend the application of transformational and instructional leadership styles for primary school principals. This type of leadership styles allows the leaders to use the shared leadership model. Principals allow HODs, committee leaders, SGBs and all divisions to operate autonomously and report to authorities. The vision of the principal is also known by everyone at the school and everyone is working towards achieving it. This type of leadership also promote curriculum monitoring and the usage of data. Principals have to monitor curriculum and analyse data to improve performance.

#### *5.4.2.2 Principals as skilful leaders*

The study findings revealed that there are skills and principles like implementing school improvement plans, implementing incentive structures for teachers, learners, and support staff, brokering professional development strategy, allocating school resources effectively, having sound and applicable policies, having skilled managers and employees, give clear lines of operation and accountability, putting all systems in place and have consistent and fair applications of rules to everyone in the school community (4.6.2.2).

I recommend that for the primary school principals to implement school improvement plans effectively, they have to develop programmes that cover all activities that cover the whole functionality of the school, such as monitoring of work, staff development, the motivation of staff and learners, using registers for resources, become consistent in the application of rules to everyone at the school and train the other managers like HODs and committee leaders with managerial skills. The circuit and the district should also continuously equip principals with leadership and managerial skills to manage and lead in a changing world. The provision of new technological resources like computers and the operation of Microsoft systems is also a priority. Principals are



sitting at the Circuit Management Team to influence the circuit programme towards their skills development programme. The circuit can recommend this plan to the district calendar or programme.

### **5.4.3 Recommendations with regard to research objective three**

Research objective three was to determine strategies and approaches put forward by principals and deputy principals from selected primary schools, which could serve as guidelines for improving mathematics in primary schools.

#### *5.4.3.1 Recruitment of mathematics teachers*

One of the strategies from the research findings to improve mathematics is the recruitment of mathematics teachers. (4.6.3.1). Mathematics teachers could be attracted by improving working conditions at schools. This can be done by allocating more money from the school budget towards the curriculum to purchase technological resources. Teachers could be awarded for best performance. The SGB can help the principals by fundraising and asking for mobile classes that could be used as mathematics classes to divide the classes during mathematics periods further to improve learners' concentration. Unemployed youth who did mathematics in Grade 12 can be recruited to assist the mathematics teachers with marking, writing homework, and practicing with the learners. This will give mathematics teachers more time to concentrate on teaching and dealing with the real challenges faced with the learners' underperformance of mathematics.

#### *5.4.3.2 Implementation of new instructional methods of teaching and learning mathematics*

Another strategy found by the research study is the implementation of new ways of teaching and learning mathematics. The findings revealed that principals should encourage teachers to do team planning and teaching because good mathematics lessons attain a positive outcome on learners' results. The good elements of a lesson can be attained by team planning and teachings such as the relationship between the questions and the learning objective, connection to the prior knowledge, engaging learners in the cognitive work, usage of graphic organisers, allowing support groups, accommodation of different groups, differentiated questions according to cognitive levels, allowance of learners to work differently and in their pace and giving feedback

in time (par. 2.7.4). Mathematics teachers' challenges are being addressed, and the teachers are developing each other in the process (par. 4.6.3.2). I recommend that principals purchase new technological apparatuses like mathematics labs, smartboards, and learner tablets, as the schools that are using them mentioned that they are very useful in improving mathematics performance. The Department should put more money into a curriculum for the principals to improve mathematics teaching by buying more useful equipment. The circuit should support schools by writing recommendations to the district and the Department of Education. The school, circuit, and the district should include training programmes for teachers on equipment usage.

#### *5.4.3.3 Encouragement of parental involvement*

Another strategy that principals can use to improve mathematics performance is to encourage parental involvement. The study revealed that parents are the key stakeholders in improving mathematics performance by supporting the learners with additional resources, help them with homework, check their books, encourage learners to study at home, monitor timetables and come to school to discuss learner challenges with mathematics (par. 4.6.3.3). Principals should encourage parental involvement at their schools because they are very important stakeholders who can help the schools to improve results. They can motivate parents by discussing and agreeing with the parents for convenient times and days and planning their agendas to shorten their meetings. The districts, circuits, and schools work together because the circuit looks at the district plan, draws a circuit plan, and follows the circuit plan. In this way, I will recommend then that the district involve the parent involvement programme in their plan, which will make the circuit and the schools to include it in their planning. Research has shown that a parent's involvement helps to improve learner performance.

## **5.5 CONTRIBUTION AND MAIN OUTCOME OF THE STUDY**

In my study, all the participants contributed immensely to identifying strategies to improve primary schools' mathematics performance. From all the schools that participated, the support or training of heads of departments (HODs) was a fruitful strategy, but there was no programme in place, specifically for HODs training. Primary school HODs lead different subjects that they do not understand themselves, and teachers are aware of, and they can cheat easily. This strategy could be effective if it

is included in the district and circuit plan, then schools can draw their plans following the circuit and the district programme. Planning, implementing, monitoring, and reviewing the HODs training programme will be discussed in brief to contribute to the training programme's development and functionality.

The district can put the training plan in their strategies to improve performance. The circuit, through the Circuit Management Team (CMT) may include the training of HODs quarterly in the circuit programme. Principals will include the circuit dates in their annual programmes. Principals will then motivate the HODs to attend and to report back the developmental strategies they achieved from the training. Principals will then monitor the implementation. Another developmental activity will be to attend teachers' content workshops at the beginning of each term to get knowledge of different subjects.

### **5.5.1 Planning**

Planning is an administrative function that details how something can be done before actually doing it (par. 2.4.1). The schools, circuits, and districts should plan how they will develop HODs towards their managerial duties to improve performance. For this plan to work, the district and the circuit have to work together to have no clashes on the district's dates and the circuit activities. The schools will develop their programmes based on the circuit plan. The circuit always draw its programme with the principals, who forms the circuit management team (CMT).

### **5.5.2 Coordinating**

Coordinating is the process of organizing people or groups to work together properly and well (par. 2.4.1). Through the circuit management teams (CMTs), schools, under the circuit manager's leadership, should form HODs' clusters. Coordinators should be selected from each cluster to coordinate workshops meetings according to the HODs' training programme. Coordinators will improve communication and ensure the progress of managers' training, which would improve mathematics performance.

### **5.5.3 Implementation**

The implementation of the HODs training programme relies on the monitoring process by the district and the circuit. The circuit and the district should develop instruments to

monitor the functionality of these programmes. Schools will also develop their instruments to check progress and impact on the skilling of HODs on their work. The training programmes may not disturb HODs' work at school because it will be in the programme, and the circuit may have one session per year.

#### **5.5.4 Review**

After implementing the HODs training plan, feedback is required to determine whether the programme is functional, and a survey can be conducted to obtain feedback from the HODs and the principals. This can be done by online survey questionnaires or on paper questionnaires. Analysis of the responses will determine the functionality of the training activity and will determine where to improve or change some methods, for example, if the workshops meetings are not workable, online training may be implemented as most people are now able to use computers and due to Covid-19 pandemic where people are not allowed to meet in numbers to prevent the spread of the virus.

### **5.6 AVENUES FOR FURTHER RESEARCH**

This study has many avenues to be explored as areas of furthering the study as mathematics is a challenge in many schools. One avenue to consider is the impact of the leadership styles of principals in improving mathematics results. The circuit and the district should train principals towards the two management styles that have been the most effective, which are the instructional and transformational styles. The plan and programme should be included in their strategic plans and the annual programmes. Qualitative approach could be used to find out challenges the primary school principals face concerning their management styles and how they can improve. The training of principals could be one strategy that may improve mathematics performance because they will have comprehensive knowledge in managing their schools.

Another avenue for further study is the recruitment of mathematics teachers. This study can be persuaded on how primary school principals can recruit mathematics teachers as they do not have mathematics specialists. They can use other ways of getting better mathematics teachers, such as influencing the appointment processes, developing their own teachers, having relationships with higher institutions, and

improving working conditions. Qualitative approach could be used in getting responses from the different principals and the strategies for the recruitment of good mathematics teachers.

Further studies may focus on ways of improving principals' skills towards their leadership to improve mathematics performance. Research has shown that effective principals are likely to perform in their school results. The study may find ways in which the Department, in collaboration with the districts and circuits, may improve principals' leadership skills. Circuits may include a programme of developing principals towards management skills in their annual programmes.

Another avenue for this study is the Department of Education's recommendations to revisit some policies that hinder mathematics performance, as the usage of mother-tongue in the foundation phase. Most research findings have shown that the language of teaching and learning in the foundation phase as a mother-tongue and the transition to the intermediate phase causes a lot of harm in the concept development and the mathematics skills of mathematics learners. A further study can be persuaded to find the challenges caused by the language of teaching and learning in the foundation phase and the transition in Grade 4 and teachers' and principals' recommendations.

This study's focus was to find out management strategies to improve mathematics performance in primary schools. Multiple studies can be undertaken, which relates to a similar study and can be extended to the high school principals because strategies are applied to improve results, which is also a concern of every teacher.

## **5.7 CONCLUSION**

This study aimed to find out different strategies that can be implemented by school principals to improve mathematics performance at Mpumalanga primary schools. The study revealed possible outcomes of applying effective management strategies in teaching and learning mathematics to improve its performance. From the research study, it is clear that all the participating principals, deputy principals, and Grade 6 teachers have deep knowledge and skills in implementing strategies to improve mathematics. There is a need in education because of the effect of the Covid-19 pandemic that all teachers and leaders from all sectors to work together and develop education for the future.

Education will never be the same after Covid-19. The process begins now by developing current strategies to improve mathematics teaching in primary schools for the future. It is evident in government schools that our learners fall behind with their schoolwork without the new technological methods. There is a great need for stakeholders to revisit their strategic planning. They may purchase laptops for teachers and tablets for the learners. Last year (2020), learners have missed a lot on their work, hoping that the work will be covered this year (2021), but it seems a similar situation, or even worse, will continue, so departmental stakeholders need to take urgent actions to remedy the situation. This also suggests that all teachers need to develop themselves towards using technological resources and be prepared for the challenges of the future.

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## APPENDIX 1: ETHICS CLEARANCE



### UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2020/07/07

Ref: **2020/05/13/30723361/28/AM**

Dear Ms BS Mpangane

Name: Ms BS Mpangane

Student No.: 30723361

**Decision: Amendments  
Approved**

---

**Researcher(s):** Name: Ms BS Mpangane  
E-mail address: bsmpongane@gmail.com  
Telephone: 0716114842

**Supervisor(s):** Name: Dr P.K. Triegaardt  
E-mail address: paul.triegaardt@gmail.com  
Telephone: +971507299807

**Title of research:**

**THE ROLE OF PRINCIPALS IN IMPROVING GRADE 6 LEARNERS' PERFORMANCE IN  
MPUMALANGA**

**Qualification:** MEd Education Management

---

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research.

The request to amend the ethics application previously approved on the 13 May 2020 is approved.

Kind regards,

**Prof AT Motlhabane**  
**CHAIRPERSON: CEDU RERC**  
motlhat@unisa.ac.za



University of South Africa  
Preller Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
www.unisa.ac.za

APPENDIX 2: Permission from circuit manager to do research in the circuit

Thank you for your support. I kindly await your response in connection with my request.

Yours sincerely

B.S. Mpangane

UNISA M.Ed. student



Signature:

Dr P.K. Triegaardt

Supervisor

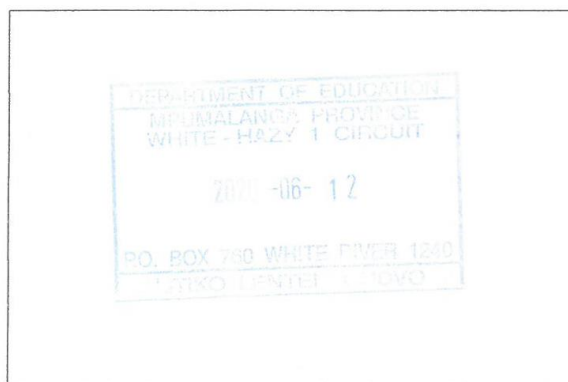


Signature:

Signature Circuit Manager



Stamp



University of South Africa  
Preller Street, Muckleneuk Ridge, City of Tshwane  
PO Box 392 UNISA 0003 South Africa  
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150  
[www.unisa.ac.za](http://www.unisa.ac.za)

### **APPENDIX 3: PERMISSION LETTER TO CIRCUIT MANAGER**

Request for permission to conduct research in the White-Hazy1 Circuit

Title of research study: *The principals' role in improving Grade 6 learners' performance in Mathematics in Mpumalanga.*

Dear Sir/Madam

I, Busisiwe Sarah Mpangane, am doing research under the supervision of Dr P.K. Triegaardt, a lecturer in the Department of Education Management and Leadership, towards a Master of Education degree at the University of South Africa.

We are inviting five selected schools in your circuit to participate in a study entitled:

The school stakeholders' perceptions of the role of principals in improving Grade6 performance in Mathematics

The aims of the research project are:

- To briefly discuss the characteristics of an effective school principal.
- To explore the factors that contribute to the poor Mathematics results in the intermediate phase in primary schools.
- To make recommendations on how principals and teachers can improve the poor results of intermediate phase learners in primary schools.

As mentioned previously, the study will entail research at five selected schools in the White-Hazy 1 Circuit. At each of the five selected schools, I would like to interview the principal, the deputy principal and one Grade 6 teacher at the selected school. The study will also entail the following steps in order to ensure a high level of professionalism:

- Each interview with the individual participants will be approximately 20 to 30 minutes
- The interviews will be done online on Microsoft Teams because of Covid-19 and therefore protecting the safety of the participants and the researcher.
- Interviews will be conducted at the times and venues suitable for the interviewees because they will be online.

- Each school as well as each participant will be assigned an alpha-numeric pseudonym (A1, B1, C1, D1, E1 for principals and A2, B2, C2, D2, E2 for deputy principals; A3, B3, C3, D3, E3 and A–E for schools). This will be done to secure and to ensure anonymity. In this way, no participant will be identifiable in any way from the results of the research.
- Participation in this study is strictly voluntary and participants may withdraw at any time without any consequence.

The benefits of this study will include a thorough investigation into the challenges and complexities involved in the role of principals, deputy principals and Grade 6 teachers in improving Grade 6 or intermediate phase Mathematics results. In this way, the principals, deputy principals, and Grade 6 mathematics will be in a better position to implement successful strategies when managing the factors that influence the learners' performance in mathematics. As a researcher, I will develop concepts and arrive at conclusions based on the relationships, patterns and themes that will be identified in the collected data from the individual interviews.

No risks are involved in this study. Furthermore, no injury is anticipated. In the case of emotional harm, the school-based support teams (SBST) at the various schools will be informed. Additionally, there will be no reimbursement or any incentives for participating in the research.

The feedback procedure will entail the following: after I have completed the interviews and processing data, I will email (due to Covid-19 pandemic) a copy of the individual transcripts to each participant in order for them to verify the accuracy of the details. Thus, they will be allowed to give their views on the interpretations of their interview. Each participant will therefore be given an opportunity to confirm the trustworthiness and credibility of their expressions in this study, which deals with the role of principals and deputy principals in managing factors that influence poor Mathematics results and strategies to improve Mathematics in primary schools.

Thank you for your support. I kindly await your response in connection with my request.

Yours sincerely

B.S. Mpangane

UNISA M.Ed. student

Signature:

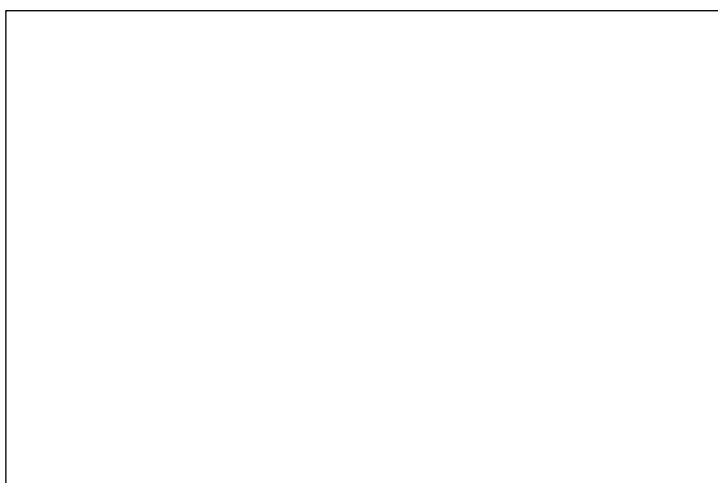
Dr P.K. Triegaardt

Supervisor

Signature:

Signature Circuit Manager

Stamp



## APPENDIX 4: PERMISSION LETTER TO PRINCIPAL

Dear Sir/Madam

My name is Busisiwe Sarah Mpangane. I am a Master's student, doing research in education management at the University of South Africa under the supervision of Dr P.K. Triegaardt, a lecturer in the Department of Education Management and Leadership.

I would like to request that your school may participate in a study entitled:

The school stakeholders' perceptions of the role of principals in improving Grade 6 performance in Mathematics.

The aims of the research project are:

- To explore the factors that contribute to poor intermediate phase Mathematics results in primary schools.
  - To briefly discuss the characteristics of an effective school principal.
  - To identify which elements of an effective lesson will assist learners to perform adequately in mathematics in the intermediate phase in primary schools.
  - To make recommendations on how principals can improve intermediate phase results in primary schools.
- 
- ❖ The study will involve research at five selected schools in the White-Hazy Circuit, of which one of them is your school. At each of the five selected schools, I would like to interview the principal the deputy principal, and the Grade 6 mathematics teacher. The study will also entail the following steps in order to ensure a high level of professionalism:
  - ❖ Each interview with the individual participants will be approximately 20 to 30 minutes.
  - ❖ The interviews will be done online on Microsoft Teams because of Covid-19 and therefore protecting the safety of the participants and the researcher. Interviews will also be video-recorded online for later transcription.
  - ❖ Interviews will be conducted at the times and venues suitable for the interviewees because they will be online, so there will be no interruptions during school hours.
  - ❖ Each school as well as each participant will be assigned an alpha-numeric pseudonym (A1, B1, C1, D1, E1 for principals; A2, B2, C2, D2, E2 for deputy principals; A3, B3, C3, D3, E3 for teachers and A–E for schools) This will be done

to secure and to ensure anonymity. In this way, no participant will be identifiable in any way from the results of the research.

- ❖ Participation in this study is strictly voluntary and participants may withdraw at any time without any consequence.

The benefits of this study will include a thorough investigation into the challenges and complexities involved in the role of school managers and teachers in improving Grade 6 Mathematics performance. In this way the school managers and the Grade 6 teachers will be in a better position to implement successful strategies when involving other schools in improving Mathematics performance in primary schools. As a researcher, I will develop concepts and arrive at conclusions based on the relationships, patterns and themes that will be identified in the collected data from the individual interviews.

No risks are involved in this study. Furthermore, no injury is anticipated and in the case of emotional harm, the school-based support teams(SBST) at the various schools will be informed. Additionally, there will be no reimbursement or any incentives for participating in the research.

The feedback procedure will entail the following:

After I have completed the interviews and processing data, I will email (due to Covid-19) a copy of the individual transcripts to each participant in order for them to verify the accuracy of the details. Thus, they will be allowed to give their views on the interpretation of their interview. Each participant will therefore be given an opportunity to confirm the trustworthiness and credibility of their expressions in this study, which deals with the factors that contribute to poor Mathematics and the strategies to improve Mathematics in primary schools.

Thank you for your support. I kindly await your response in connection with my request.

Yours sincerely

B.S. Mpangane (MED Unisa student)

Dr P.K.Triegaardt (Supervisor)

Consent

I, \_\_\_\_\_ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and I am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty.

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the voice recording of the interviews.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname (Please print)

Participant Signature

Date

Researcher Name & Surname (Please print)

Researcher Signature

Date



## **APPENDIX 5: PERMISSION LETTER TO THE PARTICIPANT**

Dear Participant

My name is Busisiwe Sarah Mpangane and I am doing research under supervision of Dr P.K. Triegaardt, a lecturer in the Department of Education Management and Leadership towards a Master of Education degree at the University of South Africa. We therefore invite you to participate in a study entitled:

The school stakeholders' perceptions of the role of principals in improving Grade6 performance in Mathematics.

The aims of the research project are:

- To briefly discuss the characteristics of an effective school principal.
- To explore the factors that contribute to the poor Mathematics results in the intermediate phase in primary schools.
- To make recommendations on how principals and teachers can improve the poor results of intermediate phase learners in primary schools.

The study is expected to collect important information that could benefit schools and principals and teachers as they implement successful strategies when managing factors that influence poor performance and implementing strategies to improve mathematics results. This will be done by means of a thorough investigation into the challenges and complexities involved in managing factors for poor results and implementing strategies to improve the results. I will develop concepts and arrive at conclusions based on the relationships, patterns and themes that will be identified in the collected data from individual interviews.

Five schools in the White-Hazy 1 circuit have been selected for this study. As a principal/deputy principal / Grade6 Mathematics teacher at one of these schools, you are invited to participate in this study because you have experience in teaching/ managing the curriculum of the school. I obtained your information from the White-Hazy 1 circuit office. At each of the five selected schools, I will interview the principal, one deputy principal and one Grade6 mathematics teacher.

The interviews with all the participants will be conducted after school hours or in your convenient time at your home (due to Covid-19 pandemic) so that your programmes are not interrupted. All these interviews will be digitally recorded. Each interview will last approximately 20 to 30 minutes. This means that I will be able to interview the principal in one afternoon, and the deputy and Mathematics teacher the following days.

Participating in this study is voluntary and you are under no obligation to consent to participation. If you decide to take part, you will be given an information sheet to keep and you will be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

The potential benefits of this study will include a thorough investigation into the challenges and complexities involved in the management of factors that influence Grade 6 Mathematics performance and how to improve the results.

In this way, principals and the school will be in a better position to implement successful strategies in improving Mathematics results in primary schools. As a researcher, I will develop concepts and arrive at conclusions based on the relationships, patterns and themes that will be identified in the data collected from the individual interviews.

No negative consequences or risks will be encountered if you participate in this study. Furthermore, no injury is anticipated. Additionally, there will be no reimbursement or any incentives for participation in the study.

You have a right to insist that your name will not be recorded anywhere and that no-one, apart from me, will know about your involvement in this research. This means that your name will not be recorded anywhere and no-one will be able to connect you to the answers you give. To ensure anonymity, your answers will be given an alpha-numeric pseudonym code and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. As an example of this, alpha-numeric pseudonyms codes used in this study are (A1, B1, C1, D1, E1 for principals; A2, B2, C2, D2, E2 for deputy principals; A3, B3, C3, D4, E3 for teachers and A–E for schools).

I will store hard copies of your answers for a period of five years in a locked filing cabinet in my private study in my house for future research or academic purposes. Electronic information will be stored on my password-protected laptop computer. I will be the only one who knows the password. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. In the future, if it is deemed necessary for the information to be destroyed, hard copies will be shredded and any electronic copies will be permanently deleted from the hard drive of the laptop computer through the use of a relevant software programme.

As previously mentioned, there will be no reimbursement or any incentives for participation in the research. Participation in this study is purely voluntary with no cost to you as a participant.

This study has received written approval from the Research Ethics Review Committee of the College of Education, UNISA. You can have a copy of the approval letter from me if you wish so.

If you would like to be informed of the final research findings or should you require any further information or want to contact me about any aspect of this study, please contact Busisiwe Sarah Mpangane on cell number: 0716114842 or e-mail: [bsmpangane@gmail.com](mailto:bsmpangane@gmail.com)

Should you have concerns about the way in which the research has been conducted, you may contact Dr P.K. Triegaardt on his mobile number +971 50 935 8073 or via e-mail [paul.triegaardt@gmail.com](mailto:paul.triegaardt@gmail.com).

Thank you for your support. I kindly await your response in connection with my request.

Yours sincerely

B.S. Mpangane (MED Unisa student)

Dr P.K.Triegaardt (Supervisor)

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#### Consent

I, \_\_\_\_\_ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and I am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty.

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the voice recording of the interviews.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname (Please print)

Participant Signature

Date

Researcher Name & Surname (Please print)

Researcher Signature

Date

## APPENDIX 6: RESEARCH INSTRUMENT

Sub-questions	Example questions	Responses by participants
What are the factors that contribute to poor Mathematics results of intermediate phase learners in primary schools?	Are principals and deputy principals aware and have a list of the factors that influence Mathematics performance at their schools?	
	How do principals and deputy principals manage the factors that influence poor performance at their schools? Are there programmes in place?	
What are the characteristics of an effective principal?	Which leadership style is followed by the principal and why?	
	What role do the principal and the deputy principal play in managing the staff performance?	
How can principals and Grade 6 Mathematics teachers improve the poor results of intermediate phase learners in primary schools?	How do principals monitor the curriculum at the school? (Heads of departments' programmes and activities; subject teachers' programmes and activities; and learners' work)	
	How is the school improvement plan (SIP) implemented by the principals?	
	How is staff development; motivation and recruitment programmes steered by the principals at the school?	
	What are the elements of an effective lesson to assist learners to perform adequately in the intermediate phase in primary schools?	
	How are parents involved in assisting learners with Mathematics challenges to improve its performance?	
	How are parents involved or taken on board in the school assessment programme to support learners?	

## APPENDIX 7: LETTER FROM EDITOR

CORRIE GELDENHUYS  
POSBUS 28537  
DANHOF 9310

☎ 083 2877088

[corrieg@mweb.co.za](mailto:corrieg@mweb.co.za)

15 February 2021

### TO WHOM IT MAY CONCERN

Herewith I, Cornelia Geldenhuys (ID 521114 0083 088) declare that I am a qualified, accredited language practitioner and that I have edited the following dissertation:

#### **THE ROLE OF PRINCIPALS IN IMPROVING GRADE 6 LEARNERS' PERFORMANCE IN MATHEMATICS IN MPUMALANGA**

BY

**BUSISIWE S. MPANGANE**

All changes were indicated by track changes and comments for the student to verify, to clarify aspects that are unclear and finalise. Serious attention still has to be paid to the format of the referencing.

The editor accepts no responsibility for any changes and corrections that are not made in the final text returned to the student.



.....  
**C GELDENHUYS**  
**MA (Lin) cum laude, MA (Mus), HOD, NDB, UOLM**

Accredited member/Geakkrediteerde lid, SATI, Membership/Lidmaatskap: 1001474 (A/E-E/A)  
Full member/Volle lid, Professional Editors Guild (PEG, Membership GEL001)  
Mediterranean Editors and Translators (MET: Membership 02393)  
European Association of Scientific Editors (EASE: Membership 5523)

## APPENDIX 8: TURNITIN REPORT

### THE SCHOOL STAKEHOLDERS' PERCEPTIONS OF THE ROLE OF PRINCIPALS IN IMPROVING GRADE 6 PERFORMANCE IN MATHEMATICS

#### ORIGINALITY REPORT

<b>21</b> %	<b>21</b> %	<b>1</b> %	<b>9</b> %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

#### PRIMARY SOURCES

<b>1</b>	<a href="http://uir.unisa.ac.za">uir.unisa.ac.za</a> Internet Source	10%
<b>2</b>	<a href="http://hdl.handle.net">hdl.handle.net</a> Internet Source	5%
<b>3</b>	Submitted to University of South Africa Student Paper	1%
<b>4</b>	<a href="http://www.cde.org.za">www.cde.org.za</a> Internet Source	<1%
<b>5</b>	Submitted to Regenesys Business School Student Paper	<1%
<b>6</b>	<a href="http://kullabs.com">kullabs.com</a> Internet Source	<1%
<b>7</b>	<a href="http://www.ehow.com">www.ehow.com</a> Internet Source	<1%
<b>8</b>	<a href="http://www.grin.com">www.grin.com</a> Internet Source	<1%

[www.ecdoe.gov.za](http://www.ecdoe.gov.za)