



University of Fort Hare



Nelson Mandela

**AN ANALYSIS OF THE USE OF THE BALANCED SCORE CARD  
AS A PERFORMANCE MANAGEMENT TOOL FOR  
MATHEMATICS EDUCATORS**

**A CASE STUDY OF AMAJINGQI SECONDARY SCHOOL**

**BY**

**NKOSINATHI LAWRENCE MONESE**

**A MINI-DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR**

**THE DEGREE OF MASTER OF PUBLIC ADMINISTRATION**

**IN**

**IN THE FACULTY OF MANAGEMENT AND COMMERCE  
AT THE UNIVERSITY OF FORT HARE**

**SUPERVISOR: PROFESSOR D.R. THAKATHI**

**28 FEBRUARY 2013**

## **DECLARATION**

I, Nkosinathi Lawrence Monese, hereby declare that this dissertation, submitted in partial fulfillment of the requirements for the Degree of Public Administration at the University of Fort Hare, is my own original work and all the sources used or quoted were indicated with references and acknowledgements.

.....

**N.L. MONESE**

**28 February 2013**

## **ACKNOWLEDGEMENTS**

I want to thank the Lord who gave me strength from day one until the completion of the research.

I also wish to thank my supervisor professor D.R. Thakhathi for his patience, guidance, encouragement and expert advice throughout. I also thank the educators and learners who participated in this research. Not least I would like to thank my wife, Lungelwa, and my daughter Lebo, for their support and understanding.

One again I give praise to my Lord for strengthening me.

## **DEDICATION**

I would like to dedicate this work to my late mother, who died in 2007 and my late mother-in-law and father-in-law who died in Dec 2011 and January 2012 respectively. May their soul rest in peace.

## ABSTRACT

In the study the researcher has investigated the effectiveness of the use of the balanced score card as a performance management tool for grade 12 mathematics teachers at Amajingqi Secondary School in Adelaide, in the Fort Beaufort district, circuit 8.

Thirty learners, four principals, four educators who teach mathematics and the mathematics Head of Department in the schools were selected as participants in this research.

A questionnaire (Appendix A) was handed out to principals, HOD's, mathematics educators and learners doing mathematics in the four schools (4) selected for the study.

The main findings of this study were:

- Mathematics teachers had an average of sixteen years of experience in the subject.
- Maths teachers do not pay much attention to slow learners.
- Learners are demotivated and need motivation to perform above average.
- Learners do not practice mathematics enough.
- Parental involvement is lacking in assisting learners with schoolwork let alone mathematics.
- Maths teachers are overloaded with work as in the schools researched one teacher would teach mathematics from Gr. 8 to 12.

## TABLE OF CONTENTS

<b>DECLARATION.....</b>	<b>i</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>ii</b>
<b>DEDICATION.....</b>	<b>iii</b>
<b>ABSTRACT.....</b>	<b>iv</b>
<b>CHAPTER ONE: INTRODUCTION AND BACKGROUND TO THE STUDY</b>	
1.1 INTRODUCTION.....	1
1.2 BACKGROUND OF THE STUDY.....	1
1.3 PROBLEM STATEMENT.....	3
1.4 RESEARCH QUESTIONS.....	4
1.5 RESEARCH OBJECTIVES.....	4
(a) PRIMARY RESEARCH OBJECTIVES.....	4
(b) SECONDARY RESEARCH OBJECTIVES.....	5
1.6 SIGNIFICANCE OF THE STUDY.....	5
1.7 LITERATURE REVIEW.....	6
1.8 THEORETICAL FRAMEWORK.....	10
1.9 PERFORMANCE IMPROVEMENT.....	11
1.10 RESEARCH METHODOLOGY.....	14
1.11 LIMITATION OF THE STUDY.....	15
1.12 POPULATION.....	16
1.13 SAMPLING.....	16
1.13.1 SAMPLING METHOD.....	17
1.13.2 SAMPLING SIZE.....	17
1.14 DATA COLLECTION METHOD.....	18
1.14.1 QUESTIONNAIRE.....	18
1.14.2 INTERVIEWS.....	18

1.15	DATA ANALYSIS PLANS.....	19
1.16	DELIMITATION OF THE STUDY.....	19
1.17	ETHICAL CONSIDERATIONS.....	19
1.18	DEFINITION OF CONCEPTS.....	20
1.19	CAPTER ORGANISATION.....	21
1.19.1	CHAPTER ONE (INTRODUCTION AND BACKGROUND OF THE STUDY).....	21
1.19.2	CHAPTER TWO (LITERATURE REVIEW RESEARCH DESIGN AND METHODOLOGY)..	21
1.19.3	CHAPTER THREE (RESEARCH DESIGN AND METHODOLOGY).....	21
1.19.4	CHAPTER FOUR (FINDINGS INTERPRETATIONS AND INFERENCE).....	21
1.19.5	CHAPTER FIVE (RECOMMENDATIONS AND CONCLUDING REMARKS).....	21
1.20	SUMMARY.....	22

## **CHAPTER TWO: THEORETICAL REVIEW**

2.1	INTRODUCTION.....	24
2.2	DEFINITION OF TERMS.....	24
2.2.1	PERFORMANCE MANAGEMENT.....	24
2.2.2	PERFORMANCE MANAGEMENT PROCESS.....	25
2.3	RATIONALE OF PERFORMANCE MANAGEMENT.....	25
2.3.1	EVALUATION.....	25
2.3.2	CONTROL.....	25
2.3.3	MOTIVATION.....	26
2.3.4	CELEBRATION.....	26
2.3.5	LEARNING.....	26

2.3.6	IMPROVING.....	26
2.4	BALANCED SCORE CARD AS A TOOL OF PERFORMANCE MANAGEMENT.....	26
2.4.1	PERFORMANCE IMPROVEMENT.....	26
(a)	TEACHING.....	27
(b)	MEASURES.....	27
(c)	TARGETS.....	27
(d)	TIMELINES.....	27
(e)	TEACHING AIDS.....	28
(f)	PERFORMANCE APPRAISAL.....	28
2.4.2	LINKING TEACHERS' EVALUATION TO PROFESSIONAL DEVELOPMENT: FOCUSING ON IMPROVING TEACHING AND LEARNING OF MATHEMATICS.....	29
2.4.3	USE DATA AND RECORDS AT DISTRICT LEVEL AND AT SCHOOL LEVEL TO IMPROVE RESULTS.....	29
2.5.1	MEASURES THAT DRIVE PERFORMANCE.....	31
2.5.2	BASIC PRINCIPLES UNDERLYING THE BALANCED SCORE CARD.....	32
2.5.3	PRINCIPLES THAT CHARACTERISE-TRATEGY-FOCUSED MANAGEMENT SYSTEM... (a) MOBILISE CHANGE THROUGH EXECUTIVE LEADERSHIP..... (b) TRANSLATE THE STRATEGY INTO OPERATIONAL TERMS..... (c) ALIGN THE ORGANISATION TO STRATEGY..... (d) MAKE STRATEGY EVERYONE'S JOB..... (e) MAKE STRATEGY A CONTINUAL PROCESS.....	32 32 32 33 33
2.5.4	THE BALANCED SCORECARD ALLOWS MANAGERS TO LOOK AT BUSINESS FROM FOUR IMPORTANT PERSPECTIVES.....	33



(a)	FINANCIAL PERSPECTIVE.....	33
(b)	CUSTOMER PERSPECTIVE.....	33
(c)	INTERNAL PERSPECTIVE.....	33
(d)	INNOVATION AND LEARNING PERSPECTIVE.....	34
2.5.5	BENEFITS OF USING A BALANCED SCORE CARD.....	34
2.5.6	SUMMARY.....	35
<b>CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY</b>		
3.1	INTRODUCTION.....	36
3.2	RESEARCH DESIGN DEFINED.....	36
3.3	RESEARCH METHODOLOGY.....	36
3.4	STUDY AREA AND POPULATION.....	39
3.5	SAMPLING SIZE AND METHOD.....	39
3.6	DATA COLLECTION.....	40
3.6.1	THE QUESTIONNAIRES.....	40
3.7	SUMMARY.....	41
<b>CHAPTER 4: DATA ANALYSIS AND INTERPRETATION</b>		
4.1	INTRODUCTION.....	42
4.2	CRITERIA FOR DATA ANALYSIS.....	42
4.3	DEMOGRAPHIC DETAILS OF RESPONDENTS FROM AMAJINGQI HIGH SCHOOL....	44
4.4	FUTURE CAREER OF LEARNERS.....	46
4.5	ANALYSIS OF RESPONSES FROM GRADE 12 LEARNERS OF LONWABO HIGH SCHOOL.....	49

4.6	ANALYSIS OF RESPONSES FROM GRADE 12 LEARNERS OF SAKHULULEKA HIGH SCHOOL.....	50
4.7	ANALYSIS OF RESPONSES OF PRINCIPAL, SCHOOL MANAGEMENT TEAM AND MATHS TEACHERS OF TEMPLETON HIGH SCHOOL BEDFORD.....	52
4.8	SUMMARY.....	53
 <b>CHAPTER 5: SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS</b>		
5.1	INTRODUCTION.....	54
5.2	SUMMARY OF FINDINGS.....	54
5.3	THE ANNALYSIS SUGGESTS THAT.....	55
5.4	CONCLUSION.....	56
<b>BIBLIOGRAPHY.....</b>		<b>57</b>
<b>APPENDIX A.....</b>		<b>61</b>
<b>APPENDIX B.....</b>		<b>62</b>
<b>APPENDIX C.....</b>		<b>63</b>

## **CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY**

### **1.1 INTRODUCTION**

The primary purpose of this study is to investigate the effectiveness of the use of a balanced score card as a tool for the performance of grade 12 mathematics teachers. As a performance model the balanced score card articulates the links between human and physical processes with lagging outcomes. It focuses on achieving an organisations strategic priorities. In the case of the schools under study, it facieses on the performance of learners in mathematics in grade 12.

Performance entails an ongoing communication between an employee and his supervisor. For purposes it includes interaction between the grade 12 mathematics educator, the principal and the head of department. Performance management seeks to gain better results from the organisation`s teams and individuals by understanding and managing performance within an agreed frame of goals, objectives and standards. According to Zielinski performance management is a system that helps people to manage their actions so that their organisation will achieve their goals. See performance management as assisting employees in their day to day roles to believe according to good standards of professional practice.

The major purpose use of performance management information is to establish accountability. In the case of this study it is to hold the mathematics teacher in grade 12 accountable for the end of the year results in his or her subject.

### **1.2 BACKGROUND**

Amajingqi High School is situated in Lingelethu location in Adelaide about 34 km from Fort Beaufort. Adelaide is a small town that lacks industrial development and relies on stock farming and crop farming. About 50% of the school`s learners come from these farms. Their parents tend to be illiterate and do not really encourage their children to study up to matric as they do

not see the need for education. The school is in circuit 8 under the Fort Beaufort district.

There are only two high schools in the area; Amajingqi in the township for black children and the former Model C school Adelaide Gymnasium, serves mainly white children and children of middle class black professionals. Feeder schools are nearby, namely 2 lower primary schools and a higher primary school. Amajingqi High School starts from grade 8 up to grade 12.

On average, the learners in the school are from a very poor background where most of the parents are not employed and on social grants from government to support them and their children. The trend is to have many children to gain more social grants. Parents do not take care of their schooling. Parents in Amajingqi are not supportive of the teachers at all. When they are called to parents' meetings less than 10% of the parents attend. The school currently has 486 learners and fewer than 30 parents come to general meetings for all parents of the school to discuss the problem teachers encounter in their classes. There is no support from the parents.

The South African Schools Act, 1996 (Act 84 of 1996) section 18 stipulates that the governing body of the school should have meetings with the parents at least once a year. In this school not enough parents attend such meetings. The poor learner performance in Mathematics in Grade 12 can be attributed in part to lack of support by the parents. Research to determine other factors that contribute to the poor performance of Grade 12 learners in Mathematics is also necessary. Given the school's background, the research will seek to discover the factors contributing to poor learner performance in Grade 12 Mathematics. The nature of the research problem is described in the next section.

### 1.3 RESEARCH PROBLEM STATEMENT

The poor performance of learners in Grade 12 Mathematics in Amajingqi High School has been a concern for some time. This school has been an underperforming school with a less than 50% pass rate from as early as 1989 when it presented Grade 12 for the very first time.

Underperformance has been especially marked in mathematics. This study will examine the Mathematics results in Grade 12 from 2005 to 2012.

YEAR	NO. WROTE	NO. PASSED	PASS %	FAILURE %
2005	30	5	17	83
2006	25	2	9	91
2007	39	2	3	97
2008	27	4	15	85
2009	18	3	17	83
2010	24	12	50	50

Department of Education District Analysis of results 2006 to 2010.

Previous examiners' reports (Department of Education, 2006) attribute poor performance in some sections of the Mathematics question paper of P1 (Algebra) to lack of interpretation of the facts in the question. This underscores what Y. Wilder.etal, 199 wrote about the need for learners to understand and be taught how to use Mathematics vocabulary, concepts and ideas. Terms like hypotenuse, parallelogram, etc. are only used in Mathematics classes. The educational level of parents will not suffice to support learners . Does that explain the poor results? A lack of discipline on the part of the learners and lack of motivation to learn on their part that is a possible cause for poor mathematics marks The problem could also lie with the level of training of the teachers. Is the teacher qualified to teach Mathematics in Grade 12? Is the teacher exposed to the new methods of teaching NCS, Natural Curriculum Statement, or of discipline from learners and a lack of motivation to learn on their part? Another problem might lie with the level of training of

the teacher, is the teacher qualified to teach Mathematics in Grade 12? Is the teacher exposed to the new methods of teaching NCS, Natural Cu is he still teaching the old way so disadvantaging the learners as they are not used to the question setting style of today's examiners? Language too may contribute to the problem. The learners do not after all, know English as their mother tongue. It may also be that the feeder primary schools have not prepared learners adequately. Are the learners being taught the basic foundations of Mathematics in the grade preceding duty to High School Mathematics. If so learners lack confidence in the subject and the Grade 8 teacher is forced to teach that learners were suppose to know. Posamentier and Jaye are of the view that learners whose parents are involved in their education generally achieve high, especially in primary school. In high school children tend to loss parental support, especially in Mathematics, since they cannot understand high school mathematics themselves. Parents are not aware that they have an impact on their children's education even if they are not educated themselves, (Posamentier and Jaye, 2006:154).

#### **1.4 RESEARCH QUESTIONS**

- Is the poor performance of Grade 12 learners in Mathematics a consequence of poorly qualified teachers ?
- Does lack of support from home contribute to poor performance?
- Is the lack of knowledge and understanding of basic concepts in Mathematics a contributory factor in poor performance of learners?

#### **1.5 RESEARCH OBJECTIVES**

##### **(a) PRIMARY RESEARCH OBJECTIVES:**

- The primary\_objective of this study is to investigate the reason for poor performance of Grade 12 learners in Mathematics so that the necessary improvements can be made.

**(b) SECONDARY RESEARCH OBJECTIVES**

- To analyse factors that contribute to this poor performance of Grade 12 learners in Mathematics at Amajingqi High School.
- To identify the needs of teachers of Mathematics. Do they need more workshops or do they not have the requisite teaching materials, such as textbooks?
- To suggest ways of motivating learners to take their study of Mathematics seriously in order to improve their results in the subject.
- To enhance parental involvement in the education of their children.

**1.6 SIGNIFICANCE OF THE STUDY**

The findings of this study will help the school to improve their Mathematics results in Grade12. The results will also help the management of the school to assess the curriculum and find new ways of teaching the subject in order to effect improvement. The findings of the study might also assist the management and the school governing body to involve parents in the education of their children, and to monitor and improve their school attendance as some learners are behind because of irregular school attendance. The study is important in that it will also encourage learners to be more serious about their schoolwork and not to see Mathematics as an impossible subject but as a regular subject that needs hard work and regular practice. In short, this study could well serve to change the attitudes of the teachers, the learners and the parents towards a partnership for the success of the learner. This subject opens doors to better opportunities for all children in general and, in particular, previously disadvantaged children.

This study also examines the key role that language plays in teaching and learning Mathematics, it is the language that affords the pupil the opportunity to transpose the result of learning namely, the knowledge acquired into its abstract

form.

### **1.7 LITERATURE REVIEW**

A balanced score card provides managers with a comprehensive framework that can translate an organisation's vision, and strategy into a coherent and linked set of performance measures. The balanced score card will provide management with an opportunity to measure performance at four levels: financial performance, customer perspective, internal processes and learning and growth, Ehlers (2005 as cited in Seromo 2010).

As a performance management tool for mathematics educators, the balanced score card will examine the following areas in order to improve the pass rate

#### **KEY PERFORMANCE AREAS**

- Teaching one of the key priorities to develop and distribute learning and teaching materials especially work books for English, accounting, mathematics and science (South Africa 2010 :152).The department of education has a detailed national teacher development plan which will look at the skills and methods of teaching for not only mathematics, but the other nationally examined subjects as well.

#### **MEASURES**

In order to improve the performance of educators there are measures that need to be in place, namely, indicators that will tell if the work is being done correctly so as to produce desired results. The obvious indicator for teachers is a better say 80% pass rate of in the learners in mathematics at Amajingqi Secondary School.



## **TARGETS**

According to SA year book 2011/2012 the Department of Basic Education has set as target that by 2014 225,000 Grade 12 mathematics and 165,000 physical science learners will pass these subjects. The target of Amajingqi Secondary School is 100% pass rate in mathematics.

## **TIME LINES**

The time line for the performance improvement of mathematics in grade 12 is that learners have to pass very well in June examinations to indicate that they will pass in the final examinations in December as well. The aim of this time line is to ensure a 100% pass rate in grade 12 mathematics at Amajingqi Secondary School.

## **TEACHING AIDS**

The main reason for having a performance management system is to make people in the organisation to perform according to what is expected of them. Obstacles to such performance must be removed and best performance encourage through availability of resources, and, in the case of mathematics teachers, by providing teachers with proper mathematics teaching aids so as to make the subject visible and practical to the learners. Teachers have to be trained in new methods of teaching mathematics and in the use of computer software that is user friendly for both learners and teachers.

### **(a) ROLE OF LANGUAGE IN TEACHING MATHEMATICS**

According to Department of Education, (South Africa 2010:151), South African learners' poor performance in Mathematics in 2005 and 2010 has been ascribed to a larger degree to problems many educators and learners experience when studying or teaching Mathematics through English when it is not their language.

Research has shown that if learners understand Mathematical concepts in their mother language, they can apply such understanding to learning the subject through English which is the language of instruction or learning, (Young, van der Vlugt and Qanya, 2005).

Mathematics has its own language that teachers have to use in class and they should not allow learners to use ordinary English to express Mathematical ideas as is happens in most of our black schools.

### **(b) PARENT INVOLVEMENT IN THE CHILD'S LEARNING**

According to Van der Stoep and Louw (1987: 162) the child's first school is home and its educators are parents. The reality within which the family exists influences the child's learning.

The parents should offer sufficient support to the child at an early age, during play, in his relationship with parents. In the case of Mathematics, children should be exposed to Mathematical toys and that trigger intellectual curiosity.

According to Duminy and Steyn (1985: 164) the parents must see to it that the child actually sits down at a certain fixed time everyday to do his or her homework. Mathematics needs a lot of practice and it is imperative that the parents play their part in encouraging the child to make time for his school work.

Duncalf (1994: 50) is of the view that every family member is affected when one of the children is preparing for exams. The parents should make sacrifices in terms of house chores that need to be given to those who are not preparing for exams as children need enough time to prepare. Parents need to motivate their children by giving them moral support, even if they do not understand Mathematics, and by creating a conducive environment at home for studying. The co-operation of parents with the teacher is very important and equally important is that parents should follow the advice given by the teacher to improve the child's progress (Van Niekerk,

1986: 164). The challenge that we currently have is that parents do not want to come to school regularly. They feel so ignorant of what is happening at school that they have an inferiority complex. Other parents do not stay with their children. At Amajingqi many parents stay in the cities while their children stay with grandparents. This creates problems for the school as in most cases these grandparents can't come to school because of distance and sometimes because of health problems.

Van Niekerk (1986:169) sees personality disturbance in one or both parents also to be a disturbing factor to the child's learning. A disturbed marital relationship between the parents makes the child insecure and the child's concentration is negatively affected.

Then too there are children who are affected by HIV& AIDS, children whose parents suffer from HIV/AIDS, or may have died from Aids. Lead families are a reality. Learners who must lead families are unable to devote enough time to their schoolwork .

### **(c) TEACHER TRAINING**

This affects the Methodology used by teachers to teach Mathematics. Avenant (1986: 237) is of the view that learners should be actively involved in their learning.

The teacher should communicate facts to the learners in having them find reasons, devise plans, do research and find answers to the problems posed by the teacher.

The teacher is just a facilitator in the learner centered lesson, and the learner actively participates in the lesson. This is the method used in the new NCS (National Curriculum Statements).

Advice from the chief marker's report of 2010 stressed the fact that teachers of Mathematics should upgrade their knowledge and skills to meet the challenges of the new curriculum, which is NCS, (Department of Education, 2010). Teachers of Mathematics should also be members of professional bodies like AMESA, Association of Mathematics

Educators of South Africa. This organisation will assist in equipping them with new strategies to teach the subject effectively and to produce the desired results in matric or grade 12.

#### **(d) ROLE PLAYED BY LEARNERS THEMSELVES**

Learners must be disciplined in time management since Mathematics needs a lot of practice (Musaazi, 1987: 183).

Anxiety amongst learners about mathematics is another cause of poor performance.

Learners who are afraid or nervous during exams usually do not perform. Worrying disrupts and lends to block achievement in Mathematics.

Anxiety is increased by unpreparedness and lack of self-confidence.

### **1.8 THEORETICAL FRAMEWORK**

#### **BALANCED SCORECARD**

- This is a performance management system model
- It articulates links between the employees and physical resources in a work place and focuses on processes to manage these so as to achieve the strategic priorities of the organisation.

#### **PERSPECTIVES OF THE BALANCED SCORECARD**

- Financial
- Customer : how the customer sees us.
- Internal business processes
- Learning and growth : how to improve and create value in the organisation.

## **BENEFITS OF THE BALANCED SCORECARD MODEL**

- Assessment of performance of employees relative to the performance of the organisation is encouraged.
- Encourages peer ranking.
- Looks at the targets agreed upon in the organisation, e.g a high matric pass rate in maths
- Setting of time frames for achieving such targets

([www.googleusercontent.com](http://www.googleusercontent.com))

### **1.9 (a) PERFORMANCE IMPROVEMENT**

In 2000 Mr Qwase, the then MEC of Education in the Eastern Cape, made reference to underperforming subjects like mathematics, science and technology as being of great concern to his department. He also very proudly announced the best performer for the entire province, Avuyile Kapolo from a rural village of Cofimvaba, St James Senior Secondary School. The MEC mentioned this to indicate that no matter how disadvantageous the background of a learner is, he or she can still do well.

The Principal's leadership style also has an effect on the performance of educators and learners. Whitaker identified four areas of strategic interaction by instructional leaders that result in higher levels of learner achievement.

- being a resource provider
- being an instructional resource
- being a communicator
- being a visible presence, to be present in the day to day activities in support of staff and learners.

Van der Waldt (2004:221) lists the following reasons poor employee performance.

- Employee absenteeism. It is very important that teachers need to be at school regularly if they are to finish the syllabus on time. In a school situation this also holds good for learners. Learners should be at school all the time, otherwise they will miss out on what the teacher has prepared. Class attendance and contact time has to be monitored if results are to be achieved (Eastern Cape Department of Education 2009). According to the grade 12 intervention plan, the monitoring of learner attendance in winter schools, extra-classes as well as spring school in September by the principal and management team of the school is paramount if the improvement of learner performance is to be achieved.
- Employees have a poor attitude. There are a number of reasons why this may be so. support from the parents who do not come to school when they are called. Learners who do not do their work also influence the attitude of the teachers towards their work. The teacher becomes demotivated when only few learners turn up for extra classes in the afternoon. As President Zuma said on January 8 , 2011, teachers must teach, be on time in class and be at school 7 hours per day (Zuma 2011:11)
- Employees play at politics instead of doing their job. This is true at Amajingqi. Here five teachers are in the branch executive of a teacher union. These teachers are always absent, attending union meetings. They have little time for teaching and as a result they contribute to the poor performance in grade 12.

## **(b) EDUCATION AND TRAINING**

The training of teachers is important if performance improvement is to be expected, (Jones 1990 as cited in Vander Waldt 2004). Subject related workshops on content, teaching methods, and new strategies of teaching mathematics should be attended. In

most cases training is limited to management development (Kamoche 1977 as cited in Vander Waldt 2004:225). Public institutions should offer training not only for managers, principals and heads of department in schools but also for subject teachers. Presently workshops for subject teachers are at such a basic level that it does not really address poor performance that resulting from lack of training in the subject.

The department of education has established an integrated quality management system (IQMS) which seeks to ensure quality teacher performance (Afrimap 2007). IQMS is a system designed to improve the performance of teachers through incentives in the form of salary progression from one salary level to the other. This integrated quality management system involves class visits, control of work, meeting set pass rate targets both in grade 12 and the lower grades and involvement in extra-curricular activities like sport. This system was designed to evaluate the work of the teacher. Most of the training offered by the department of education is on NCS-national curriculum statements that have replaced OBE-outcome based education (changes in the system of education have too often contributed to the poor performance of teachers as well as learners in grade 12. The department merely offered crash courses of two or three days to familiarize teachers with the new system. Needed were certificate or diploma courses or at least 3 to 6 months in-service training to fully equip educators to implement the new systems of education.

Teachers as workers need to be motivated. Highly motivated workers work up to 90% of their ability but if the motivation is low the employee's performance will also come down. (Starling 1982:416)

### **(c) PERFORMANCE MEASUREMENT**

The performance of educators has to be compared with some standard desired performance (Kester.etal.1993:69). School targets will be expressed in terms of pass rates in the grade 12 exam results. The performance of educators also depends on work load. An educator who has a class of 60 in grade 12 cannot perform as well and meet set targets as can an educator with smaller classes. External factors do play a role in meeting the desired target.

### **1.10 RESEARCH METHODOLOGY**

Thloalele, Netonzhe and Lutabingwa (2007: 562) see research methodology as the heart and blood of a research proposal. It describes the methods and procedures that the researcher will use to conduct the research.

#### **(a) QUANTITATIVE RESEARCH METHOD**

According to Leedy and Ormrod (2001 as cited in Mokone-2011) quantitative research is used to answer questions about relationships amongst measured variables with the purpose of explaining, predicting and controlling phenomena. This approach is sometimes called the traditional, experimental or positivist approach. It tends to be associated with measuring, (Barnes, 1992 as cited in Mokone 2011).

#### **(b) QUALITATIVE RESEARCH METHOD**

According to Mouton and Marais (as cited in Mokone-2011) qualitative methods advocate approach to examine an empirical world, and requires the researcher to interpret the real world from the perspective of the subject of his study. Creswell (1994 as cited in Mokone- 2011) states that qualitative research occurs in natural settings where human behavior and events normally happen.



This study opted for qualitative research because it concerns learners in grade 12 and their performance in mathematics. The researcher will also look at the contribution of teachers, parents and the school governing body to see what role they play in the performance of grade 12 learners in mathematics at Amajingqi High School.

According to Kumar (2005: 17) quantitative and qualitative research methodology differ in methods, models and procedures used. If the research uses a qualitative mode of enquiry, the researcher is more likely to use unstructured interviews or observation as his method of data collection, and in communicating findings, the researcher will be more descriptive and narrative in nature.

Ghuri (as cited in Mukwevho 2011) notes that qualitative research studies social process such as behaviour, organisational functioning and interactions. For this study qualitative research will be appropriate as the study looks at the performance of learners and their interactions with the teachers.

#### **1.11 LIMITATION OF THE STUDY**

Limitations of research are such as may restrict scope of the study so that the conclusions one draws may not be generalizable or may not address certain relevant issues (Hofstee 2006: 87). Limitations will affect the reliability of the conclusions.

This study was carried out over two years. At the selected schools many children, teachers and parents come from other towns. This presented a challenge in terms of getting questionnaires back in time as from Fort Beaufort (about 38km from Adelaide where the study was conducted).

### **1.12 POPULATION**

Best and Kahn(as cited in Mokone 2011) define population as a group of individuals that have characteristics in common and that are of interest to the researcher for the purposes of the study. The researcher will use the following population:

- 29 learners of Amajingqi High School who do Mathematics.
- All grade 12 educators (they are about thirteen).
- The chairperson and secretary of the SGB.
- Ayabonga Mathafeni, a learner who always gets very high marks in grade 12 Maths at Amajingqi will also be interviewed along with two more learners successful learners.
- The researcher will also interview a Mathematics teacher and learner from Sakhululeka High school as this school has achieve top marks in Maths for the past three years.
- The researcher will also interview a teacher and one or two learners with top grade 12 mathematics marks from Templeton High.

### **1.13 SAMPLING**

It will be impossible to study the whole population; hence sampling will be used to identify manageable numbers of respondents Brynard and Hanekom (as cited in

Mukwevho 2011) list the advantages of sampling as follows:

- It simplifies the research
- It cuts costs> travelling and stationary for questionnaires
- It saves time if the population is from a very large geographical area

### **1.13.1 SAMPLING METHOD**

Purposive sampling will be used for this study. Leedy and Ormrad (as cited in Mukweho 2011) define purposive sampling as a selection of participants in view of the study's particular purpose or interest to the study. Niewehuis (as cited in Mukone 2011) sees purposive sampling that in which participants are pre-selected using criteria relevant to the particular study.

In this study, the samples are of poorly performing learners and teachers in a school, the best performing learners and teachers in a school, the parents of children who do well in maths as well as parents of those do poorly. The deputy principal of a poor performing school is was chosen to complete the questionnaire.

Such of sampling will be suitable for this study. It is less costly and not time consuming. The samples are based entirely on the judgment of the researcher. The sample contains the most characteristics or typical attributes of the population to be studied, Singleton et al, (as cited in Mukone 2011).

### **1.13.2 SAMPLE SIZE**

- For purposes of this study five learners who are not doing well in mathematics at Amajingqi high will be asked to answer the questionnaire as well as learners with high marks in mathematics at this school. The questionnaire will be answered by learners doing grade 12 at the following schools: Amajingqi Secondary School, Sakhululeka High School and Templeton High School.
- Parents of children at Amajingqi who have high marks and children doing well at two

other schools were selected to determine their view why children do well in maths.

- Teachers of mathematics in the schools do well and teachers who are not teaching maths were consulted for their views as to the reasons for poor performance in mathematics at the school under study.
- The deputy principal of the school under study was consulted to give a management perspective on the problem of poor performance of maths at Amajingqi.

## **1.14 DATA COLLECTION METHOD**

### **1.14.1 QUESTIONNAIRE**

A questionnaire is a form of structured interview, where all respondents are asked the same questions and are often offered the same options in answering them (yes/no, ranked on a scale, etc) Hofstee (2006 : 133). In this study a questionnaire will be used as in qualitative studies questionnaires are often used, Kerlinger (as cited in Mokone 2011).

A questionnaire is a device that enables the respondents to answer questions, Vockel and Asher (as cited in Mokone 2011). This study's questionnaire uses scale questions. The questionnaires will be distributed to learners, parents, SGB members and teachers in all the schools sampled for this study.

### **1.14.2 INTERVIEWS**

One on one with open ended questions were also conducted. In a relaxed atmosphere, the researcher was able to take notes during the interview. A recorder was used with permission from the interviewee (Hofstee 2006: 135).

### **1.15 DATA ANALYSIS**

Data analysis is critical in any study; it allows the researcher to reach conclusive and verifiable answers to the aims and objectives of the study.

In this study the SPSS will be used to analyze the data- the advantages of SPSS are as follows:

- It is accessible and user friendly
- It is logical and easy to follow
- It allows the researcher to summarize and display the data in tables

The SPSS is able to analyze data without losing its objectivity throughout the research process. Data will be analyzed using mean, mode, standard deviations, pie charts and histograms, when used well they can be effective visual aids (Greetham 2009:251).

### **1.16 DELIMITATION OF STUDY**

Poor performance in grade12 mathematics is of concern in the whole province of the Eastern Cape. For practical purposes the study will focus at Amajingqi high in Adelaide because of time constraints and financial challenges.

### **1.17 ETHICAL CONSIDERATIONS**

Babbie and Mouton (2001) define ethics as an issue associated with morality, dealing with matters of right or wrong. It is clear that ethics are standards that guide behavior or actions of people (Mukwevho 2011:45)

For ethical reasons, the respondents were fully informed about the aim of the research. Confidentiality was maintained by ensuring that anonymity is adhered to. Permission to conduct research at Amajingqi high school was sought from the management and the SGB of the school. The respondents' right to privacy was adhered to. Transparency was maintained throughout the study.

The district director and the EDO of Fort Beaufort district office of education under which Amajingqi falls was also informed about the intention to conduct the study in one of their schools.

### **1.18 DEFINITION OF KEY CONCEPTS**

EDO	:	Education development officer
Model C school	:	Former whites only schools that operated prior to 1994
SASA 84 of 1996	:	South African Schools Act 1996 (Act 84 of 1996)
Parent	:	Person legally entitled to custody of a learner
SGB	:	School governing body as contemplated in section 16(1) of the South African Schools Act of 1996
Examiner's report	:	Report of the examiner tabulating expected answers on A particular exam paper.
NCS	:	National curriculum statement introduced in 1995\
Deputy Principal	:	Second person appointed to head a school
Principal	:	An educator appointed as head of the School
GET	:	General education and training band starting from grade R to grade 9
FET	:	Further education and training band starting from grade 10 up to grade 12
Grade	:	Part of an educational programme which learner may complete in one school year.
Educator	:	Any person who teaches, educates or trains other persons or who provides professional educational services including professional therapy and education psychological

services

Learner : A person receiving education or obliged to receive education in terms of the South African School Act 84 of 1996

## **1.19 CHAPTER ORGANISATION**

This study will consists of the following five chapters:

### **1.19.1 Chapter 1: INTRODUCTION**

This chapter provides an overview highlighting the research background, research problem, research objectives, research questions, and importance of the study and chapter organisation.

### **1.19.2 Chapter 2: LITERATURE REVIEW**

This chapter sets the theoretical framework of the study which will be guided by the research objectives, questions and hypothesis.

### **1.19.3 Chapter 3: RESEARCH DESIGN AND METHODOLOGY**

This chapter explains why the research is qualitative. It will discuss sample size, data collection, data analysis, validity and reliability, limitations and ethical considerations.

### **1.19.4 Chapter 4: FINDINGS AND DISCUSSIONS:**

This chapter discusses the findings. The sections of this chapter will reflect sections contained in the research questions, objectives and hypothesis.

### **1.19.5 Chapter 5: CONCLUSIONS AND RECOMMENDATIONS:**

This chapter will present the conclusions from the findings of the study. Lastly, there will also be recommendations putting forward arguments as to why teachers must be work-shopped regularly in mathematics teaching and be kept up to date with the new developments, such as new assessment guidelines and methodology of teaching NCS; National Curriculum Statements. It will also argue why parents of Amajingqi High School should be encouraged by the school governing body to be involved in the learning of their children.

### **1.19 SUMMARY**

In conclusion the benefit of the balanced score card is to encourage assessment of performance of mathematics teachers relative to the performance of learners. This will create value in the organisation, in our case the school, and ultimately will benefit learners who are doing mathematics.

Adelaide is a small town without firms or factories. The future of learners in this community lies in education.

Improvements of learners in mathematics in grade12 will open doors for these children, as most careers need a pass in mathematics.

If children at this school do well after grade12 at tertiary institutions, it has implications of improving the lives of the people in this town.

Parent involvement is paramount in the learning of their children even if parents are not educated, their support is necessary.

This study envisages a future partnership between the feeder primary schools and the high school so that basic concepts will be taught before the learners come to high school.



Learners have a responsibility as well if they want to perform better in mathematics. Education is referred to as a three legged pot, where each leg represents the stakeholders that are supposed to work together for the success of the learner. They are the parent, the learner and the department of education (Eastern Cape department of education (Umdibanisi 2009:2). No matter how enormous the challenges of poverty and lack of support from home, and inadequate resources, if the learner works very hard and puts a lot of time into his or her studies, practicing mathematics daily, the result is a pass at the end of the year.

This study will investigate causes of learner underperformance and examine role played by learners and other role players in order to change the situation for the better Amajingqi High School.

In the next chapter, a number of theoretical perspectives on the study will be explained

## **CHAPTER TWO: THEORETICAL REVIEW**

### **2.1 INTRODUCTION**

No doubt the effective management of organisations and people is one of the challenges facing organisations in the 21<sup>st</sup> century. Grobler, Warnich, Carnell, Elbert and Hatfield.

South African organisations are facing increased demands from the public for accountability in the expenditure of public funds by government and communities. Efficiency, effectiveness and capacity building are everywhere required.

South African schools are faced with the challenge of underperformance in mathematics and sciences, especially secondary schools in the Eastern Cape.

The need for performance management systems in South Africa is underlined by demands for better quality service. In the case of schools, this refers to better performance by educators who teach mathematics.

Performance management is an ongoing communication process undertaken in partnership between an employee and his supervisor.

This study examines the effectiveness of the use of the balanced scorecard as a tool to manage the performance of grade 12 educators who teach mathematics. The key objective of the school is to achieve its strategic priorities.

### **2.2 DEFINITION OF TERMS**

#### **2.2.1 PERFORMANCE MANAGEMENT**

According to the department of HR management, University of Johannesburg (2005/2006) performance management is a process or setting in which people are enabled to perform to the best of their abilities.

### **2.2.2 PERFORMANCE MANAGEMENT PROCESS**

According to Bascal performance management is an ongoing communication process between an employee and his supervisor. That involves establishing annual expectations and an understanding about the following:

- The essential job functions an employee is expected to do.
- How the employee's job contributes to the goals of the organisation.
- What is means in concrete terms by "doing the job well"?
- How the supervisor and an employee will work together to improve employee performance.
- How the performance will be measured.
- How to identify barriers to good performance and remove them.

### **2.3 RATIONALE OF PERFORMANCE MANAGEMENT**

According to Behn organisations use performance management to achieve specific managerial purposes.

#### **2.3.1 EVALUATION**

People manage performance of the organisation so that they can evaluate it.

#### **2.3.2 CONTROL**

It is a measure of performance to see whether individuals or workers have complied with the mandates.

### **2.3.3 MOTIVATION**

Managers use performance management systems to learn how to do better or how to improve performance. They may use the result to motivate such behaviour.

### **2.3.4 CELEBRATION**

Organisations need to commemorate their accomplishments, such rituals tie people together, give them a sense of their individual and collective relevance and motivate future efforts.

### **2.3.5 LEARNING**

Performance management provides information that can be used to learn; from this managers can learn what works and what does not.

### **2.3.6 IMPROVING**

In order to improve, managers need to determine what exactly should be done differently by whom. This can be done by figuring out which changes in plans procedures or personnel might produce improvements and managers have to figure out how to implement the indicated changes.

## **2.4 BALANCED SCORECARD AS A TOOL OF PERFORMANCE MANAGEMENT**

According to <http://en.wikipedia.org/wiki/balance> a balanced scorecard is a strategic management tool. It is a strategic planning and management system that is used in business and industry, government and non-profit organisations world-wide to align business activities of the organisation to its vision and strategy of improving the performance of the organisation and monitor the organisation's performance against its strategic goals.

### **2.4.1 PERFORMANCE IMPROVEMENT**

In order to improve performance of educators teaching mathematics the following key

performance areas need to be looked at:

**(a) TEACHING**

Mathematics teachers need to be developed first in terms of the content knowledge, to be better equipped to teach the subject with confidence at grade 12 level. The key priorities of the national government in education is to develop and distribute teaching and learning material, in the form of workbooks for English, accounting, mathematics and science from grade 8 to 10 South Africa (2011:152).

The department of basic education nationally has a national development plan which will look at the skills and methods of teaching of mathematics, science and English.

**(b) MEASURES**

There have to be indicators terms of which to look at the performance of teachers. These must be used to measure the performance of mathematics teachers. If you cannot measure it, you cannot manage and improve it. Measurement motivates.

**(c) TARGETS**

The department of national education has set as target that by 2014 the number of those who pass mathematics and science in grade 12 would be 225 000 and 165 000 respectively. Teachers have to set targets that are realistic in order to align the school's strategic plan with the provincial target which is obviously in line with the national target. The target of Amajingqi, for 2012, is a 100% pass rate in mathematics.

**(d) TIMELINES**

The timeline is that learners and teachers have to work hard in the June examinations and September trial exams which must suggest that in December the pass rate will be 100 percent in mathematics at Amajingqi Secondary School.

### **(e) TEACHING AIDS**

Performance management through the use of the balanced scorecard will assist an organisation to perform optimally, the employees knowing what is expected of them. This can be made possible by removing obstacles to excellence and providing resources that enable the workers to do their job to the best of their ability. In the case of mathematics teachers this requires the availability of teaching aids to make the subject content visible and more meaningful to the learners.

Mathematics teachers need to be trained in new computer software that is user friendly for both teachers and learners. This will assist in the improvement of learner performance.

### **(f) PERFORMANCE APPRAISAL**

Performance appraisal is one of the most important functions of a manager and can be a very critical aspect in achieving objectives in a coordinated manner. According to Stoner, Freeman and Gilbert Jr., performance appraisal has the following four major purposes:

- To let employees know formally how their current performance is rated.
- To identify employees who deserve merit raises,
- To locate employees who need additional training and
- To identify candidates for promotion

A formal appraisal system is when the manager and the employee meet at a predetermined time, say quarterly, to assess the performance of an employee. According to Stoner, Freeman and Gilbert Jr., there are four different formal appraisal systems:

- Manager appraising an employee
- A group of managers appraising an employee
- A group of peers appraising a colleague
- A group of employees appraising a manager

#### **2.4.2 LINKING TEACHER EVALUATION TO PROFESSIONAL DEVELOPMENT: FOCUSING ON IMPROVING TEACHING AND LEARNING OF MATHEMATICS**

<https://docs.google.com/viewer?>

The use of teacher evaluation to measure teacher effectiveness may be a tool to help the teachers improve their performance. This can only be effective when school principals know how to use the evaluation results to guide teachers towards professional growth. The outcome of the evaluation results will be used for both accountability of the teacher for the performance of the learners in mathematics as well as improvement of the teacher concerned in his or her professional capacity.

This should be focused in particular on teachers who are not meeting the expectations in terms of their classroom performance and performance of the learners in terms of end of the term or the year results.

#### **2.4.3 USE OF DATA AND RECORDS AT DISTRICT LEVEL AND AT SCHOOL LEVEL TO IMPROVE RESULTS**

Student achievement data alone is not enough. This will not allow schools to diagnose the problem of poor performance in mathematics by grade 12 learners –

<http://www.edexcelcemadia.net//publications/2008/>

Also, district managers need to create the preconditions and processes that foster higher achievement and learner performance.

Education leaders both at district and school level need to take the balanced scorecard approach that has reshaped how private and public sector firms have approached data management.

The balanced scorecard makes use of standard metrics that reflect past performance and, crucially, complement these with operational metrics on customer satisfaction, internal

processes and the organisation's learning and innovation capabilities – the key predictors of future success.

The proponents of the balanced scorecard approach recognise the enormous value of customer relations, information technology and employee skills.

An emphasis for the purpose of this study will be on employee skills – where the development of teachers will be paramount in order to produce results in the future. The department of education and the schools should invest in research and teacher development.

In Employing the balanced scorecard in education entails articulating goals for student or learner achievement and other key learner outcomes and translating them into measure for improving operational efficiency inside and outside the classroom.

- **Customer satisfaction**

- Schools should see to it that parents and learners are satisfied and must not hurt the feelings of the people they serve, by poor results every year. Relevant data needs to be collected by the district officials for every school for every subject for proper analysis. Underachievers should be made to account.

- **Data connected across content areas and to outcomes**

Do the principals receive the support they need from district offices in terms of resources, textbooks, hiring of math teachers? Are new principals developed and trained?



### **2.5.1 MEASURES THAT DRIVE PERFORMANCE**

Business leaders are confronted with the reality that if you can't measure it, you can't manage it. In other words, effective performance management requires accurate performance measurement.

The value of measurement is that it identifies where action should be taken. Effective performance measurement systems must be able to:

- Guide employees to take the right actions in situations where action is required.
- Gauge the effectiveness of those actions.

A performance measurement system, then, is a closed loop system that embodies situational analysis of information, corrective actions, and result evaluation.

The balanced scorecard is a proven performance measurement system. It is a comprehensive strategic performance management system and methodology. It is a framework for defining and communicating strategy, for translating strategy into operational terms, and for measuring the effectiveness of strategy implementation. <http://www.balancedscorecard.org>

### **2.5.2 BASIC PRINCIPLES UNDERLYING THE BALANCED SCORECARD.**

According to the principles underlying the balanced scorecard are:

- If you can't measure it, you can't manage and improve it.
- Measurement motivates
- Without any compensation incentives tied to achieving strategic targets, the simple act of measuring and monitoring performance causes people to pay attention to what is measured.
- The power of measurement is well known and precedes the introduction of the balanced scorecard.

<http://www.balancedscorecard.org>

Prior to the balanced scorecard, performance measurement systems were purely financial or driven by local operational improvement and quality programs. These were not aligned to the strategic plans of the organisations. These disconnections are particularly problematic for public schools as they focus only on short term measures and not on the long term strategic objectives of the schools.

The balanced scorecard allows the district office to look across all the departments and to ensure they are aligned to the district strategy. This then is filtered through to schools that fall under that district.

The balanced scorecard captures both financial and nonfinancial elements and describes cause and effect linkages that drive results in the district. <http://www.balancedscorecard.org>

### **2.5.3 PRINCIPLES THAT CHARACTERISE A STRATEGY FOCUSED MANAGEMENT SYSTEM.**

#### **(a) MOBILIZE CHANGE THROUGH EXECUTIVE LEADERSHIP**

The leader of the management of the school needs to have a strong strategy and a vision as to where they want the organisation to go.

- The management has to develop a case for change.

#### **(b) TRANSLATE THE STRATEGY INTO OPERATIONAL TERMS**

The strategic map and scorecard translates the school's strategy into terms that everyone in the school can understand and act upon. The principal has to see to it that measures and targets of the school are updated annually.

#### **(c) ALIGN THE ORGANISATION TO STRATEGY**

Once the balanced scorecard is created by the management of the school, its objectives should cascade down to the teachers and support staff. This will help each area in the

school to understand how it contributes to the strategy of improving performance at the school. This allows all the personnel at school to talk the common language related to better student achievement in mathematics and other learning areas.

**(d) MAKE STRATEGY EVERYONE'S JOB**

Communication and education are critical for the execution of the strategy lead to school improvement. The principal must align the district priorities with the school's, using the balanced scorecard. The communication is done by the heads of departments and the principal in staff meetings, and in departmental meetings in the case of HOD's.

**(e) MAKE STRATEGY A CONTINUAL PROCESS**

The balanced scorecard allows strategy to happen continually not just at an annual strategy review session. The scorecard serves as an agenda for facilitating ongoing strategic discussions between the principal and the staff.

**2.5.4 THE BALANCED SCORECARD ALLOWS MANAGERS TO LOOK AT BUSINESS FROM FOUR IMPORTANT PERSPECTIVES WHICH ARE:**

**(a) FINANCIAL PERSPECTIVE**

How do we look at shareholders?

**(b) CUSTOMER PERSPECTIVE**

How do customers see us?

**(c) INTERNAL PERSPECTIVE**

What must we excel at? As a company that serves the public you need to excel at what you do in order to attract clients and, in the case of the public sector, for the people to have confidence in you as service providers.

#### **(d) INNOVATION AND LEARNING PERSPECTIVE**

Can we continue to improve and create value? As a company the manager and the staff are looking at ways to innovate and learn new ways of being productive and to give excellent service. In the case of the school this means that teachers must research new ways of teaching in order to produce good results of mathematics.

#### **2.5.5 BENEFITS OF USING A BALANCED SCORECARD**

According to <http://ww.tutorzu.net/bussinness/strategy/balanced-scorecard-introduction.html>.

The use of the balanced scorecard.

- Helps companies focus on what has to be done in order to create a breakthrough performance.
- Makes a strategy operational by translating it into performance measures and targets.
- Helps break down corporate level measures so that local managers and employees can see what they need to do well if they want to improve organisational effectiveness.
- Provides a comprehensive view that overturns the traditional idea of the organisation as a collection of isolated, independent functions and department.
- Acts as an integrating device for a variety of corporate programs.
- Helps align key performance measures with strategy at all levels of an organisation.
- Transforms strategy into action.
- Provides strategic feedback and learning.
- Maximizes co-operation – team members are focused on helping one another to succeed.
- Allows more open channels of communication amongst the team members in the organisation.
- Balanced scorecard allows improved decisions and better solutions and this helps to find better results.

### **2.5.6 SUMMARY**

According to Seremo the balanced scorecard has been implemented successfully in many organisations in the private sector as well as the public service though there is not enough literature in South Africa supporting this notion for the public service.

The balanced scorecard is not a necessarily punitive and hard exercise but an exercise that opens room for employees to grow and to measure that growth.

In the case of schools and other public sector departments the balanced scorecard will help managers with their teams to transform strategy into action – team work will be maximized and team members will be focused on helping each other to succeed and in the process the organisation will meet its targets and satisfy the customers, the public that deserves service. When this happens the teachers will be empowered with skills and learners will pass. In the next chapter the research design and methodology of the study will be presented.

## **CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY**

### **3.1 INTRODUCTION**

According to McMillan and Schumacher (2001: 10) research methodology refers to the overall procedure whereby the researcher selects data and analyses procedures to investigate a specific problem.

The study outlines the research design and methodology, study area, population, sampling used by the researcher to collect data, sample methods, sample size, data collection and data analysis as conducted at Amajingqi Secondary School.

### **3.2 RESEARCH DESIGN**

McMillan and Schumacher (1993: 157) define research design as a plan for selecting subjects, research site and data collection procedures to answer the research questions. They further state that a research design is the plan and structure of the investigation used to obtain evidence to answer questions. This means that the research design describes the procedures for conducting the study, including aspects such as when, from whom and under what conditions the data was obtained.

In this research, the researcher makes plain the procedures to be followed in order to analyse the use of the balanced scorecard as a performance management tool for mathematics educators. In setting out research methodology the study area, population, sampling size and method, data collection method, data analysis method and the researcher's ethical conduct all pass review.

### **3.3 RESEARCH METHODOLOGY**

According to Leedy and Ormrod (2005: 12) research methodology is the general approach the researcher takes in carrying out the research project. To some extent this approach dictates the particular tools the researcher needs to select.

The types of methods that were used in the analysis of the use of the balanced score card as a performance management tool for mathematics teachers were both quantitative and qualitative methods. According to Leedy and Ormrod (2005: 12) quantitative methods are used to seek explanations and predictions that will generalize to other persons and places, with the purpose of confirming and validating relationships and to develop generalizations in terms of a large sample that represents the population, in a form that is easily converted to numerical indices while the findings are communicated in numbers or statistics. On the other hand, qualitative methods are used to seek a better understanding of complex situations, often with the purpose of describing and explaining the phenomena from the participant's point of view, and the data are collected from an informative small sample through observations and interviews from which the findings are communicated descriptively.

The qualitative method was used in this study to analyse the use of the balanced scorecard as a performance management tool for mathematics teachers. The researcher distributed questionnaires with different closed questions, which allowed the collection of statistical information for the sampled schools in the Fort Beaufort district, namely in Adelaide, Bedford and Fort Beaufort. The sampled schools were Amajingqi Secondary School, Sakhuleka High School, Templeton High School and Lonwabo High School.

In quantitative studies statistical information is summarized in tables and figures. Qualitative studies focus on the description of the themes that emerge in the analysis of the narrative material, McMillan and Schumacher (2001: 12).

- **NARRATIVE QUALITATIVE DATA**

In qualitative studies the data are narrative descriptions rather than numeric values.

Narrative descriptions can be obtained by having conversations, unstructured interviews

with subjects, by making detailed notes or by using records. These data are called qualitative data.

In quantitative studies basic descriptive information, using statistics is used. In quantitative studies the following additional information is also provided:

- The name of the statistical test use
- The value of the calculated statistics
- Its significance. Quantitative data analysis involves the use of appropriate techniques suitable for figures and tables. There is also application, evaluation and deduction for each and every table and figure presented. Quantitative data analysis may also include the demographic details of respondents such as age distribution, gender distribution, years of service, home language and academic qualifications of the respondents.

Quantitative research involves the systematic collection of numeric information usually under conditions of considerable control and analysis of that information using statistical procedures. This approach involves measuring social phenomena and drawing some conclusions about relationships between them and is concerned with numbers.

Qualitative data analysis involves an inductive approach which is the process of developing generalizations from specific observations. Data are in the words and sentences, in quotations and examples. The following also constitute qualitative data analysis:

- Factual evidence and analytic interpretations.
- Detailed description of specific settings and situations.
- An inductive approach. Inductive reasoning is the process of reasoning from specific



observations to more general rules. In fact, inductive reasoning is grounded theory.

### **3.4 STUDY ARE A POPULATION**

The study was conducted in Adelaide in circuit 8 of Fort Beaufort district in the Nxuba Municipality under the Amathole district municipality in the Eastern Cape. Circuit 8 has four(4) secondary schools and ten(10) primary schools. The researcher distributed questionnaires at 4 secondary schools.

### **3.5 SAMPLING SIZE AND METHOD**

According to Babbie and Mouton (2001: 48), a sample is representative of the population from which a number is selected. The aggregate characteristics of the sample should closely approximate those same aggregate characteristics in the population. This is the group of people the researcher selected from a larger population in order to obtain the needed information.

The researcher used purposive sampling to select the respondents directly involved in the teaching of mathematics in secondary schools and learners currently doing grade 12 mathematics in schools that are performing well in the subject as well as those learners that are in doing the subject in the schools that have been underperforming in grade 12 mathematics. Heads of departments of mathematics in both sets of schools were included. The researcher sampled four(4) schools namely Amajingqi Secondary School, where the case study is conducted, Sakhululeka High School, Templeton High School and Lonwabo High School. The researcher distributed questionnaires to the deputy principal and the Amajingqi Secondary School management team.

Seven questionnaires were distributed at Templeton high school, one(1) to the principal and six(6) to educators. Ten questionnaires were distributed to Lonwabo High School, one(1) to the principal and nine(9) to educators. Ten questionnaires were distributed to Sakhululeka High School, one(1) to the principal and nine(9) to educators. A total of sixty(60) questionnaires were distributed.

### **3.6 DATA COLLECTION**

The research has a choice of using different research instruments. As a result, from the several key data collection instruments the researcher selected one which was more relevant to the study for the purpose of data collection. To this end a questionnaire is useful as a research tool.

(1) Survey research is one of the most important areas of measurement in applied research.

These could be in the form of a questionnaire or interview. Boone (2003) maintains that although surveys often investigate subjective issues, quantitative or qualitative can be used. According to Watkins (2004), the survey design mostly used is the descriptive survey as opposed to analytical survey. The descriptive survey has as its purpose, the use of a representative sample, which allows for inferences to be made about the population as a whole. Furthermore, descriptive surveys indicate how many members of a population have a certain characteristic according to Cooper (1995), there are three primary types of data collection (survey) methods that can be distinguished, namely:

- (i) personal interviewing
- (ii) telephone interviewing
- (iii) self-administered questionnaires

#### **3.6.1 THE QUESTIONNAIRES**

A self-administered questionnaire is by far the most common instrument when collecting data, Babbie and Mouton (2001: 48). It puts the interviewer in control of the flow of information and reduces the likelihood of misunderstanding questions. It consists of a set of questions presented to participants for his or her feedback. Advantages of using a questionnaire include, among others, that information at a low cost per respondent. Also respondents are able to give more honest answers than when interviewed and respondents answer question in a fixed order. The researcher also noted the following: ambiguous questions be avoided. Leading questions generate bias and must be avoided especially with self-administered questionnaires, close

ended questions are recommended.

### **3.7 SUMMARY**

In this chapter, a research plan was developed for data collection in assessing the relevance and avoiding wrong question to be asked. Secondly, a sampling plan was formulated from a defined population as a representative of a large population.

The research population is identified and a sample size determined. In primary data, the researcher will use questionnaires to collect data and ultimately, the collected data will be analysed.

The result could be used by the school as a case study and other schools with similar problem, poor performance of grade 12 mathematics.

In Chapter 4, the data will be analysed using relevant statistical techniques and results of the study will be discussed.

## **CHAPTER 4: DATA ANALYSIS AND INTERPRETATION**

### **4.1 INTRODUCTION**

Large numbers of South Africans in the post-apartheid era feel that the time for policy debate and the “play of the blame game” is over and the time for policy implementation and service delivery has arrived. Any time the National Minister of Basic Education announces the matric results, the state, educationists, parents and concerned individuals are quick to condemn educators and teacher unions as being responsible for those learners who failed their exams citing lack of commitment, dedication, in effective supervision and lack of control on the part of the teachers. Teachers on the other hand would shift the blame to the state for lack of prompt delivery of textbooks and other learner, teacher, support materials (LTSM), shortage of teachers, infrastructure, frequent change of curriculum and other logistics. The reality of the matter is that all stakeholders should come to the party, and accept and embrace the principle of shared-responsibility.

Analysis of the matric results also shows that there has been a sharp drop in the percentage pass rate over the years in mathematics. The most recent Annual National Assessment (ANA) results that was released in 2012 showed that only five percent of the Grade 9 learners who wrote the mathematics paper obtained over fifty percent. This should be of great concern to all stakeholders.

It is also true that not all schools are dysfunctional. There are quite a number of public and private schools who combine the limited resources for every effective use.

### **4.2 CRITERIA FOR DATA ANALYSIS**

Both manual tabulation and electronic processing have been used to analyse the data. For this research the data was collected from questionnaires as well as from other reliable sources such as media reports. The characteristics of individual people are

called variables because they may have lots of different values, such as for example, the ages of respondents. When data is collected the initial result is usually a list of the observations for each variable. In this instance, the researcher was concerned with the overall picture rather than individual demographic data. The following criteria were adhered to:

- Summarisation of data by grouping it into meaningful proportions. Items which had similar patterns, features, similarities and interest were classified in the same group. This has been done for the purpose of a comprehensive data analysis.
- Presentation of data in a clear way by arranging it in a tabular form. Tables are drawn to make data easier to follow and understand.
- Classification of data and the upbringing of it to life using appropriate graphs of given data as well as the interpretation of such graphs were attempted.
- Graphical techniques such as histograms, or the cumulative frequency curve, charts and multiple bar charts have used to convey statistical results.
- A careful inspection of graphical output can convey information more vividly and quickly than the same information contained in numerical tables and written report.
- The graphical displays, however, give the underlying patterns. The various graphs used in this data analysis display findings concisely, clearly and in an easy to understand format.
- Charts such as the pie chart, simple bar chart and the multiple bar were used to pictorially display categorical data from qualitative variables. The charts compare the relative number of observations in different category.

- The use of a key is needed to distinguish between the categories and again to make meaningful and accurate comparisons between any two quantitative or qualitative sets of data.

#### 4.3 DEMOGRAPHIC DETAILS OF RESPONDENTS FROM AMAJINGQI HIGH SCHOOL (GRADE 12 LEARNERS)

**TABLE 4.1: AGE OF RESPONDENTS**

AGE GROUP IN YEARS	TALLY	FREQUENCY
12 – 15		
19 – 19	#### III	8
20 – 23	II	2
24 – 27		
27 and above		
<b>TOTAL</b>		<b>10</b>

In table 4.1, none of the Grade 12 learners were aged between 12 – 15 years, eighty percent were aged between 20 – 23 years. None of them was twenty-four or older. This shows that many of the respondents had reached majority. They completed the questionnaires independently, and make their own choices, for example, in choosing their subjects.

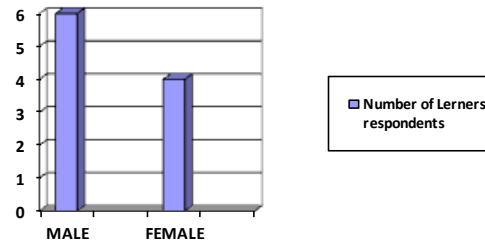
**TABLE 4.2 SEX OF RESPONDENTS**

SEX	NO OF RESPONDENTS
MALE	6
FEMALE	4
<b>TOTAL</b>	<b>10</b>

Referring to table 4.2, six of the respondents were male as against four females. This may be depicted in the form of a histogram as shown below:

#### 4.1 SEX OF RESPONDENTS

H  
I  
S  
T  
O  
G  
R  
A



#### 4. HISTOGRAM

In histogram 4.1 above, sixty percent of Grade 12 learners from Amajingqi High School who responded to the questionnaire were males and forty percent were females.

It could be inferred from the sample, that more males offered mathematics than did females.

**TABLE 4.3 REASONS FOR CHOOSING MATHS AS A SUBJECT**

QUESTION	RESPONSES
Why have you chosen mathematics as part of your subjects?	<ul style="list-style-type: none"> <li>- Most of the things I would like to do in future requires maths.</li> <li>- Maths helps me to understand other Subjects</li> <li>- It is requirement for other careers</li> <li>- Maths will help me to pursue my dream of becoming a doctor</li> <li>- I like maths and I am good at it.</li> <li>- Maths is inter-related with many subjects</li> <li>- Maths helps me to think logically.</li> </ul>

It maybe deduced from table 4.3 that learners know the importance of choosing maths as a subject. They consider maths to be an important subject that is required to gain entry to many career paths at tertiary levels.

**4.4 TABLE 4.4 FUTURE CAREER OF LEARNERS**

CAREER CHOICE	NO OF LEARNERS
Social Worker	1
Medical Engineer	1
Manager	1
Electrical Engineer	1
Engineer	1
Astronomy	1
Medical Doctor	1
CEO	1
Financial Advisor	1
Economic Analyst	1
<b>TOTAL</b>	<b>10</b>



**TABLE 4.5 QUESTIONS AND RESPONSES ABOUT MATHEMATICS AND THE MATHEMATICS TEACHER**

QUESTION	RESPONSE			
	YES	% YES	NO	% NO
1. Do you think maths is a good subject?	10	100	0	0
2. Do you have a maths teacher?	10	100	0	0
3. Do you have sufficient maths textbooks?	9	90	1	10
4. Does the teacher pay attention to slow learners?	7	70	3	30
5. Would you recommend to Grade 9 learners to choose mathematics when they are in Grade 10?	10	100	0	0

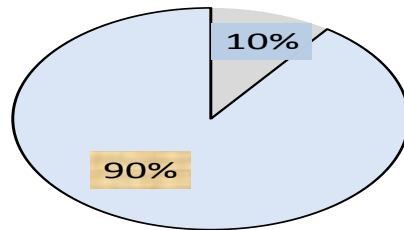
It may be deduced from table 4.5 that hundred percent of the respondents think that mathematics is a good subject, hundred percent of the learners have a mathematics teacher currently, ninety percent of respondents have sufficient maths textbooks whereas ten percent of them indicated they do not have sufficient maths textbooks. Again, seventy percent of the learners agreed that the maths teacher pays attention to slow learners as against thirty percent who did not think so. They think the maths teacher does not pay attention to slow learners.

Also, all the respondents (hundred percent) agreed that they would advise grade 9 learners to choose mathematics as a subject when they are in grade 12. Furthermore, Grade 12 learners are mindful of the fact that mathematics is a good and important subject in the curriculum. For now, they have a maths teacher, but the question that arises is whether the teacher is employed on an SGB post (School Governing Body Post) which is temporary in nature or is employed permanently by the state. With the current redeployment taking place in the Education Department, it is not easy for the Department of Education to quickly replace a

teacher when he or she resigns, retires, dies or is promoted.

#### PIE CHART 4.1

The rate at which the mathematics teacher teaches may be represented by the pie chart below:



In pie chart 4.1 ninety percent of grade 12 learners in Amajingqi High School confirmed that their maths teacher is fast in teaching the subject whereas ten percent said the maths teacher was slow. The nature of the subject is such that the teacher needs to be fast but at the same time he/she has to establish whether or not the learners do cope with the fast pace, and take into account their level of understanding.



For the learners' response reflected in above it is clear that eighty percent of the respondents confirmed that they sometimes understood the maths lessons. Twenty percent of them said they understood the lessons. This implies that most of the learners did not understand all the lessons or topics. This may be attributed to the fact that the teacher was moving at a faster pace than their level of understanding could accommodate.

**TABLE 4.6**

QUESTION	RESPONSE		
	YES	NO	SOMETIMES
1. Do you practice maths everyday?	10%	0%	90%
2. Are you doing well in maths?	10%	30%	60%

Table 4.6 shows that ten percent of the learners in Amajingqi High School practice maths every day, while ninety percent practice maths sometimes and not one did not practice maths at all. Clearly, the learners are not consistent with their academic work. Maths requires constant practice. Certain strategies must be adopted to get learners to practice maths on a daily basis. These may include homework and assignment. Short tests or class tests would help to keep them busy at all times. Also, ten percent of the Grade 12 learners doing maths are doing well in the subject, while thirty percent said they were not doing well, whereas sixty percent (60%) did well sometimes. The number of learners doing well in maths is too small and something needs to be done the die maths teacher and the School Management Team. Immediate plans must be put in place to address the situation, and encouragement and motivation must be provided. Perhaps a person they respect in the community should come and motivate the Grade 12 learners periodically.

#### 4.5 TABLE 4.7 ANALYSIS OF THE RESPONSES FROM GRADE 12 LEARNERS IN LONWABO HIGH SCHOOL

QUESTION/STATEMENT	YES	% YES	NO	% NO	SOMETIMES	NOT SURE
1. Do you think maths is a great subject?	10	100	0	0	0	0
2. Do you have a maths teacher?	10	100	0	0	0	0
3. Is your maths teacher going to finish the syllabus before Oct. 2013?	6	60	1	10	0	30%
4. Does your teacher pay attention to slow learners?	6	60	4	40	0	0

5. Do you understand his lessons?	3	30	0	0	70%	0
6. Do you have sufficient textbooks?	9	90	1	10	0	0

In table 4.7, shows that a hundred percent of Grade 12 learners doing maths thinks mathematics to be good subject in the curriculum. A hundred percent of the Grade 12 learners in Lonwabo High School confirm that they have a mathematics teacher. On the question of completion of the syllabus, sixty percent of the respondents agreed that the maths teacher would complete the syllabus whereas ten percent (10%) does not think so. Thirty percent of the learners were not sure. Furthermore, sixty percent of the Grade 12 learners in Lonwabo High School indicated that their maths teacher paid attention to slow learners as against forty percent (40%) who replied "NO" to the question. Thirty percent of the learners understood the maths teacher's lessons while seventy percent (70%) understood the lessons sometimes. Also, ninety percent thought they had sufficient textbooks while ten percent indicated that they did not have sufficient textbooks.

It was confirmed that the learners had a maths teacher and sufficient textbooks for mathematics. It's one thing to have a textbook, it's another to make good use of it. Learners are to be encouraged to solve problems everyday from the textbooks. On the other hand, the maths teacher should pay special attention to slow learners for every topic.

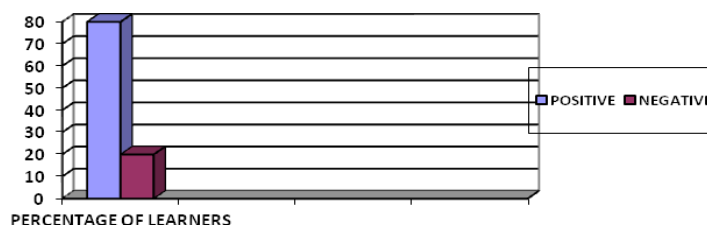
**4.6 TABLE 4.8 ANALYSIS OF QUESTIONNAIRES GIVEN TO AND COMPLETED BY GRADE 12 LEARNERS IN SAKHULULEKA HIGH SCHOOL**

QUESTION/STATEMENT	% YES	% NO	% SOMETIMES	% NOT SURE	FAST	SLOW
1. Is the maths teacher fast or slow in teaching?	-	-	-	-	100%	0
2. Do you think your maths teacher will complete the syllabus at the end of the year?	60	-	-	40	-	-

3. Does the teacher pay attention to slow learners?	70	30	-	-	-	-
4. Do you have sufficient textbooks	90	10	-	-	-	-
5. Do you practise maths everyday?	40	60	-	-	-	-
6. Are you doing well in maths?	10	-	90	-	-	-

Table 4.8 shows that all of the Grade 12 learners in Sakhululeka High School felt the maths teacher was fast in teaching, and that sixty percent of the learners thought the teacher would complete the syllabus before they write their matric exams; forty percent were not sure as to whether the maths teacher would finish the syllabus or not. Also, seventy percent of the respondents confirmed that the teacher paid attention to slow learners as against thirty percent (30%) who said the teacher did not pay attention to slow learners. Furthermore, ninety percent of the respondents have sufficient maths textbooks while ten percent did not think so. In addition, forty percent (40%) of the respondent did practise maths everyday, while sixty percent practice maths sometimes, not everyday. Only ten percent of the respondents were doing well in maths. Ninety percent did well sometimes. Since learners have enough textbooks for mathematics they should be encourage and motivated to practise maths everyday to improve their performance.

#### HISTOGRAM 4.2 – LEARNERS ATTITUDE TOWARDS MATHS



The above histogram shows that eighty percent of the learner respondents had a positive attitude towards maths. Twenty percent showed a negative attitude towards mathematics. A strategy needs to be developed by the maths teacher, his/her Head of Department and the SMT

(School Management Team) to change the attitude and perception of some learners towards maths. To do well in the subject, learners should develop a positive attitude towards it. This will undoubtedly become an intrinsic motivation for them.

**4.7 TABLE 4.9 ANALYSIS OF RESPONSES FOR PRINCIPAL, SCHOOL MANAGEMENT TEAM AND THE MATHS TEACHERS IN TEMPLETON HIGH SCHOOL IN BEDFORD.**

QUESTION	YES	NO	STRONGLY DISAGREE	DISAGRE	NEUTRAL	AGREE	STRONGLY AGREE
1. Is there a supervision of both the teacher and learners work?	✓						
2. Are there subject committees in your school?	✓						
3. Are all the departments in your school working effectively towards the achievement of specific objectives?	✓						
4. Do teachers prepare lesson plans before going to class?	✓						
5. There is a variety of maths textbooks in your school						✓	
6. Do you give special attention to slow learners during and after school?	✓						

Table 4.9 shows that the School Management Team, the maths teacher and the principal confirm that there was supervision of both learners' and educators work once a month and that all departments were working effectively towards the achievement of a specific objective. A variety of textbooks were used. This is good practice. Before teachers went to class, they had to prepare using lesson plans. This eliminates poor teaching. It could also be inferred that teachers at Templeton High School gave special attention to slow learners either during normal school hours or after school. This forms part of remedial teaching.

**TABLE 4.10 PERCENTAGE PASS IN MATHS FOR THE PAST 3 YEARS IN MATRIC EXAMS:**

	<b>2010</b>	<b>2011</b>	<b>2012</b>
LONWABO HIGH SCHOOL	40	21	19
AMAJINGQI HIGH SCHOOL	60	50	25
SAKHULULEKA HIGH SCHOOL	71,9	62	22

Table 4.10 reflects learners' performance in maths in matric exams in the past three years. Learner performance has been dropping consistently over the period under consideration.

#### **4.8 SUMMARY**

In conclusion, learners have indicated that mathematics is a good subject which will assist them in their career choices. They have enough textbooks for the subject, what they expect to happen is for the mathematics teachers to pay attention to slow learners. The learners feel that the mathematics teachers in the sampled schools where the research was conducted were to fast when teaching.

It would be necessary that the Department of Education employ mathematics teachers permanently.

Learners respondents across the board confirmed that they practised mathematics occasionally. This need to change if they want to pass. Learners should practise mathematics on a daily basis. Learners need to be encouraged to have a good attitude towards the subject if they want to do well. **The next section proposes a number of recommendations with final concluding remarks.**

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS**

#### **5.1 INTRODUCTION**

The purpose of the study was the investigation of the effectiveness of the use of the balanced score card as a tool for the performance of grade 12 mathematics teachers. It is clear that the improvement performance of mathematics teachers depends on the teachers themselves, on their style of teaching and on resources but also on the learners, their commitment to their work, and their disciplined practicing of mathematics.

#### **5.2 SUMMARY OF FINDINGS**

The responses from Amajingqi Secondary School learners and Lonwabo High School learners show that learners do not practise mathematics everyday and this has an effect in the results at the end of the year. It is also clear that learners in Amajingqi High School need to be motivated more to study and practise regularly. The teacher has to pay attention to slow learners as is not always the case now.

At Templeton High School, a school with a good mathematics pass rate for three consecutive years, the responses of the principal, the SMT and mathematics teachers show that attention is paid to slow learners. The work of teachers and learners is supervised by the head of department. Teachers use a variety of textbooks to teach.

The management of the school monitors the lesson plans of the teachers. All the departments at the school as a team towards the achievement of specific objectives, in our case, that grade 12 learners should pass well at the end of the year in all subjects, including mathematics.



### 5.3 THE ANALYSIS SUGGESTS THAT:

- Mathematics teachers in all the schools where the research was conducted had an average of sixteen years teaching experience. This clearly showed that the teachers are experienced enough to handle Grade 12 classes. The schools do use a variety of textbooks in mathematics for learners to use. It is necessary to making sure that learners use them effectively. There is a need for mathematics learners to practise Maths everyday in order to keep abreast of the teacher. Maths teachers should have some patience to accommodate slow learners and give them extra attention either during the normal school hours or after hours. This would keep learners busy all the time. Another area of motivation is to give learners feedback after every exercise. It also emerge that learners should be consistently motivated to study mathematics. One way of doing this is by praising them when they do well. Another way is by organizing a speech and prize giving day for the whole school and rewarding learners who have excelled in each subject. Parental involvement is also very crucial. The school should communicate with parents about the performance of their children in mathematics periodically. Where necessary, parents should be called to school to inspect learners' work.
- The use of audio-visual aids in modern teaching is most welcome. Learners are inspired/motivated when they view DVDs on power-point-presentations. This removes boredom from the classroom.
- Morning classes, afternoon classes and Saturday classes may be good for catch-up programmes in addition to Winter and Spring school. The aim is to complete the syllabus on time and to do revision. This could improve learner performance.
- The government needs to appoint maths teachers permanently in schools where there are vacancies or where there is a shortage of maths teachers. It is quite

unreasonable for one maths teacher to teach from Grade 8 through Grade 12.

## RESEARCH

In order to improve the performance of teachers, mathematics educators need to do research on how to teach mathematics in a better way so as to make the subject much more user friendly and fun for learners. Teachers must also make use of computer software to teach

## 5.4 CONCLUSION

In conclusion, further research should be conducted in schools around Fort Beaufort and Adelaide not sampled here to determine the causes of poor performance in grade 12 mathematics examination as well as to find ways that lead to better performance.

On the part of the teachers, the department of education has to see to it that there are qualified mathematics teachers in all the grades. Educators should use a variety of methods when teaching in order to cater for slower learners as well.

It is very clear that learners must see the rationale to study mathematics since it opens doors to many careers. This alone should motivate the learners not to fear the subject but to want to do it. Teachers should use a variety of methods to teach as they teach learners that are at different levels of understanding.

As there are continuous changes in the curriculum, teachers need to study further in mathematics teaching and update themselves. The department of education needs to invest more in the training and coaching of mathematics teachers.

## **BIBLIOGRAPHY**

Avenant, P.J.1986.Guidelines for successful teaching. Durban; Butterworth Publishers.

Afrimap.2007.Effective service delivery in the Education and health sectors: a discussion paper .London. open society institute network publication.

Babbie, E. and Mouton, L. (2001) The Practice of social Research. Cape Town: Oxford University Press.

Bless C. and Higson-Smith, C. 1995. Fundamentals of social research methods:

An African perspective. Cape Town. Creda Communications

Brynard, P.A. and Hanekom, S.X. 1997. Introduction to research in Public Administration and related academic disciplines. Pretroria. Van Schaik.

Doming, P.A and Sohnge, W.F 1986.Didactics: Theory and practice.2nd ed.Capetowna: Maskew Miller Longman.

Duminy, P.A. and Steyn, P.D.G. 1985.Education 1: A course in Didactics and Method.2nd ed.Capetown: Maskew Miller Longman.

Duncalf, B. 1994.How to pass any exam. Britain: Kylecathie Ltd.

Ghuri, P and Granhaug, K. 2005. Research method in Bussiness Studies: A practical guide. England.prentice-hall

Greetham,B.2009.How to write your undergraduate dissertation.Hamshire :Palgrave Macmillan

Henson, K.T. 2005. Writing for Publication: Road to Academic Advancement: Boston: Pearson.

Hofstee, E.2006. Constructing a good dissertation: A practical guide to finishing a master's, MBA or PHD on scheduled.Sandton.EPE Publishers.

Ijeoma, E .2011.Research Methodology.Bisho.University of Fort Hare.

Johnston-Wilder, S.; Johnston-Wilder, P; Pimm, D.; Westwell, J.1999.Learning to teach mathematics in the secondary school: A companion to school experience.London.Routledge Falmer.

Kumar ,R.2005.Research Methodology: A step by step guide for beginners .2nd ed.London.Sage Ltd.

Kester,I.H;Painter,C and Barnes,C.1993.Management in the public sector:challenge and change.London;Chapman and Hall.

Leedy, P.D. and Ormrod, J.E. (2005). Practical Research. Planning and Design. (8<sup>th</sup> Edition). New Jersey. Pearson Prentice Hall.

Marx, S. Bosch, S. Reynders, H.,J.J., van Rooyen, S. 1998. Bussiness Management. Pretoria. Van Schaik

Mc Millan, JH. And Schumacher, (2001). Research in education. (5<sup>th</sup> edition). New York: Longman

McNel, P. 1990. Research methods. Second edition. London. George Raitledget and Sons.

Mokone ,M.M. 2011.An investigating into the challenges that cause poor performance, on students with disability at institutions of higher learning in Limpopo Province:A case

study of university of Venda. University of Venda.

Mukwevho, A.C. 2011. The effectiveness of infrastructural maintenance and curriculum capacity development budgeting by selected public schools in Vuwani cluster. University of Venda.

Musaazi, J.C.S. 1987. The theory and practice of educational administration. Hong Kong. Macmillan Publishers.

Posamentier, A.S.; Jaye, D. 2006. What successful Maths teachers do, grade 6-12: 79 researched-based strategies for standards-based classroom. California. Corwin Press.

Starling, G. 1977. Managing the public sector. USA: The Dorsey press.

Sutherland, R. 2007. Teaching for learning mathematics. New York. Open university press.

Sylvester, A.B. 2003. Quantitative methods. USA. Ohio state university.

Thoalele, C.; Nethonzhe, T.; Lutabingwa, J. (2007). Foundational considerations in selecting a research topic and writing a thesis or dissertation proposal. Journal of public administration, 42, 548-563.

Van Niekerk, P.A. 1986. The teacher and the child in educational distress. Stellenbosch. University publishers and booksellers.

Van der Waldt, 2004. Managing performance in the public sector: concepts, considerations and challenges. Landsdowne: Juta Ltd.

Walliman, N. 2005. Your undergraduate dissertation : The essential guide to success. London. SAGE.

Young ,D.;Vandervlugt,J.;Qanya,S. 2005.Understanding concepts in mathematics and science:A multilingual learning and teaching resource book in English, isiXhosa, isiZulu and Afrikaans. Capetown. Maskew Miller Longman.

<http://www.en.wikipedia.org/wiki/balance>

<http://www.edexcellencemedia.net//publications/2008>

<http://ww.tutorzu.net/bussinness/strategy/balanced-scorecard-introduction.html>

[www.googleusercontent.com:balanced score card](http://www.googleusercontent.com:balanced%20score%20card): retrieved 19/09/2012.

## **LEGISLATION**

South Africa. South African schools Act 84 of 1996

South Africa. The constitution Act 108 of 1996

## **OFFICIAL DOCUMENTS**

Eastern Cape Department of Education. Chief markers report on mathematics 2011.

National Education Department. Examiner's report on national subjects 2006.

Eastern Cape Department of Education.umdibanisi.2009.

Zuma, J.Z.2011.Statement of the National Executive Committee of the ANC on the occasion of the 99th anniversary of the AND.

## **APPENDIX A: QUESTIONNAIRE TO: RESPONDENTS**

Dear Sir/Madam

My name is Nkosinathi Lawrence Monese and I am currently employed by the Eastern Cape Department of Education.

I am currently holding a position of principal at Amajingqi, Sec. School in Adelaide, Circuit 8 in the Fort Beaufort District.

I am currently studying with the University of Fort Hare where I have registered for a masters degree in public administration (an analysis of the use of the balanced scorecard as a performance management tool for mathematics educators. A case study of Amajingqi, Sec. School)

Your participation in this project will provide useful information on this topic. I can assure you that your responses will be completely anonymous and will not be used for any other purpose.

Your co-operation will be highly appreciated.

Name of researcher: Nkosinathi Lawrence Monese

**SIGNED:** \_\_\_\_\_

**ADDRESS:** P.O. Box 30

ADELAIDE

5760

**Tel:** 083 367 3674

**APPENDIX B**

Enquiries: N.L. Monese

083 367 3674

P.O. Box 30  
ADELAIDE  
5760  
4 Jan 2013

The District Director  
Fort Beaufort District  
Private Bag X2041  
FORT BEAUFORT  
5720

Dear Sir

**APPLICATION TO CONDUCT RESEARCH PROJECT AT SCHOOLS IN  
CIRCUIT 8 AND CIRCUIT 7**

1. The above matter bears reference.
2. I hereby request permission to conduct my research project with Fort Hare University in the schools in circuits 8 and
3. The topic of my research is an analysis of the use of the balanced scorecard as a performance management tool for mathematics educators. A case study of Amajingqi Sec. School.
4. I hope this study will benefit stakeholders in the Department of Education.
5. I will be glad if my application can be taken into consideration.

Yours faithfully

.....

**Nkosinathi Lawrence Monese**



**APPENDIX C**

Enquiries: N.L. Monese

083 367 3674

P.O. Box 30  
ADELAIDE  
5760  
4 Jan 2013

The Principal  
Amajingqi Sec. School  
P.O. Box 30  
ADELAIDE  
5760

Dear Sir/Madam

**REQUEST TO CONDUCT RESEARCH PROJECT AT YOUR SCHOOL**

1. The above matter bears reference.
2. I hereby request permission to conduct research project with the University of Fort Hare in your school with mathematics teachers and grade 12 maths learners.
3. The topic of my research is an analysis of the use of the balanced scorecard as a performance management tool for mathematics educators. A case study of Amajingqi Sec. School.
4. I hope this study will benefit concerned stakeholders in the Department of Education.
5. I will be glad if my application can be taken into consideration.

Yours faithfully

.....  
**Nkosinathi Lawrence Monese**

**APPENDIX C**

Enquiries: N.L. Monese

083 367 3674

P.O. Box 30  
ADELAIDE  
5760  
4 Jan 2013

The Principal  
Templeton High School  
P.O. Box 53  
BEDFORD  
5780

Dear Sir/Madam

**REQUEST TO CONDUCT RESEARCH PROJECT AT YOUR SCHOOL**

1. The above matter bears reference.
2. I hereby request permission to conduct research project with the University of Fort Hare in your school with mathematics teachers and grade 12 maths learners.
3. The topic of my research is an analysis of the use of the balanced scorecard as a performance management tool for mathematics educators. A case study of Amajingqi Sec. School.
4. I hope this study will benefit concerned stakeholders in the Department of Education.
5. I will be glad if my application can be taken into consideration.

Yours faithfully

.....

**Nkosinathi Lawrence Mone**

**APPENDIX C**

Enquiries: N.L. Monese

083 367 3674

P.O. Box 30  
ADELAIDE  
5760  
4 Jan 2013

The Principal  
Sakhululeka High School  
P.O. Box 270  
FORT BEAUFORT  
5720

Dear Sir/Madam

**REQUEST TO CONDUCT RESEARCH PROJECT AT YOUR SCHOOL**

1. The above matter bears reference.
2. I hereby request permission to conduct research project with the University of Fort Hare in your school with mathematics teachers and grade 12 maths learners.
3. The topic of my research is an analysis of the use of the balanced scorecard as a performance management tool for mathematics educators. A case study of Amajingqi Sec. School.
4. I hope this study will benefit concerned stakeholders in the Department of Education.
5. I will be glad if my application can be taken into consideration.

Yours faithfully

.....

**Nkosinathi Lawrence Monese**

**APPENDIX C**

Enquiries: N.L. Monese

083 367 3674

P.O. Box 30  
ADELAIDE  
5760  
4 Jan 2013

The Principal  
Lonwabo High School  
P.O. Box 29  
BEDFORD  
5780

Dear Sir/Madam

**REQUEST TO CONDUCT RESEARCH PROJECT AT YOUR SCHOOL**

1. The above matter bears reference.
2. I hereby request permission to conduct research project with the University of Fort Hare in your school with mathematics teachers and grade 12 maths learners.
3. The topic of my research is an analysis of the use of the balanced scorecard as a performance management tool for mathematics educators. A case study of Amajingqi Sec. School.
4. I hope this study will benefit concerned stakeholders in the Department of Education.
5. I will be glad if my application can be taken into consideration.

Yours faithfully

.....

**Nkosinathi Lawrence Monese**

## 1. INSTRUCTIONS ON HOW TO COMPLETE THE QUESTIONNAIRE

Read the following carefully before filling in the details on the questionnaire.

1.1 Where applicable, the questions should be answered with an X

### EXAMPLE 1

Question: Who do you think appoints a mathematics educator?

<b>ANSWER</b>	SGB	1	
	Minister of Education	2	X

The respondent has indicated that the Minister of Education appoints a Mathematics educator.

1.2 In some questions, you will be required to indicate on a five-point scale (marked 1-5), the extent to which you agree or disagree with the given statement. The following meaning is, for example, attached to the figure:

1 = strongly disagree

2 = disagree

3 = neutral

4 = agree

5 = strongly agree

### EXAMPLE 2

Statement: All educators teaching mathematics have the necessary mathematics qualifications

**Answer**

1	X	2		3		4		5	
---	---	---	--	---	--	---	--	---	--

The respondent strongly disagrees with the statement in this example.

- 2.3 Some questions will require that you indicate whether you agree or disagree with the statement.

**EXAMPLE 3**

Statement: Stakeholders outside the school play a leading role in the development of mathematics policy.

Agree		Disagree	X
-------	--	----------	---

The respondent indicated that he/she disagrees with the statement.

**EXAMPLE 4**

Often a question will have a mere “YES” of “NO” as an answer. However you could be asked to motivate your answer

Yes		No	
-----	--	----	--

**3. QUESTIONNAIRE TO PRINCIPAL, SCHOOL MANAGEMENT TEAM (SMT) AND MATHEMATICS EDUCATORS OF AMAJINGQI HIGH SCHOOL**

- 3.1 Demographical (Personal details of respondents – Quantitative Data)

3.1.1 What rank/post do you hold?

Principal	1	
Deputy Principal	2	
Head of Department	3	
Other	4	

3.1.2 Indicate your age group, please

18-25	1	
26-30	2	
31-35	3	
36-40	4	
41-45	5	
46-50	6	
51-55	7	
55-60	8	
61-65	9	

3.1.3 Indicate your sex, please

Male	1	
Female	2	

3.1.4 Years of service with the Department of Education

Less than 5 years	1	
5 to 10 years	2	
11 to 15 years	3	
16 to 20 years	4	
More than 20 years	5	

3.1.5 My home language is:

English	1	
Afrikaans	2	
Xhosa	3	
Other	4	

3.1.6 Academic Qualification

My highest qualification is:

Standard 8 / Grade 10	1	
Matric / Grade 12	2	
Certificate(s)	3	
Diploma(s)	4	
Undergraduate degree(s)	5	
Post graduate degree	6	
Other	7	

**4. SPECIFIC QUESTIONS REGARDING THE REASONS BEHIND POOR PERFORMANCE IN MATHEMATICS BY HIGH SCHOOL LEARNERS**

4.1 Do you have a subject policy for Mathematics?

Yes		No	
-----	--	----	--

4.2 Do you consider Mathematics as an essential subject in the school curriculum?

Yes		No	
-----	--	----	--



4.3 Give a reason to support your answer in 4.2.

.....  
.....  
.....

4.4 There are enough textbooks and other learner and teacher support materials (LTSM) for learners and teachers

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.5 In your own opinion, do you think learners who enrol in Grade 8 have a better understanding of the basic mathematical principals and operations eg. Bodmas?

Yes		No	
-----	--	----	--

4.6 Are there subject committees in your school?

Yes		No	
-----	--	----	--

4.7 How often do departmental meetings take place?

.....  
.....  
.....

4.8 Do you have a Head of Department (HOD) for mathematics?

Yes		No	
-----	--	----	--

4.9 Are there enough qualified mathematics teachers in your school?

Yes		No	
-----	--	----	--

4.10 Is there proper supervision of work in your school? (Not at all / sometimes / always)

4.11 Does the School Management Team create a positive teaching and learning environment?

Yes		No	
-----	--	----	--

4.12 If your answer to 4.11 is YES, how is it done?

.....

.....

.....

If your answer to 4.11 is NO, give reasons.

.....

.....

.....

4.13 Do you think your Mathematics teachers have the knowledge of the curriculum and learning programmes?

None of them		Some of them		All of them	
--------------	--	--------------	--	-------------	--

4.14 Is there lesson planning, preparation and presentation by mathematics educators?

Yes		No	
-----	--	----	--

4.15 Is the consistent learner assessment in line with the work schedule?

Yes		No	
-----	--	----	--

4.16 Are there professional development programmes and support in the field of work for mathematics educators in your school?

Yes		No	
-----	--	----	--

4.17 Do Mathematics teachers spend additional time with learners who score below average in mathematics?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.18 Do mathematics teachers attend workshops organised by the district periodically?

Yes		No	
-----	--	----	--

4.19 Is there a platform in place where mathematics teachers in your feeder schools liaise with your mathematics teachers to bridge content gaps?

Yes		No	
-----	--	----	--

4.20 Does your school set achievement targets every year for all grades?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.21 Do you think mathematics teachers use variety of methods and approach for the teaching of the subject?

Yes		No	
-----	--	----	--

### HUMAN RELATIONS

4.22 Do you think good human relations contribute to effective teaching and learning and school development?

Yes		No	
-----	--	----	--

4.23 There is efficient and effective communication among all mathematics teachers in my school.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.24 How do you motivate mathematics educators and mathematics learners in you school?

.....

.....

.....

4.25 Briefly explain the main root causes of poor performance in mathematics in your school?

.....  
.....

4.26 What are your strengths at the moment in achieving good passes in mathematics in all grades?

.....

4.27 What do you think your school can do better to change the situation?

.....

**Thank you for your commitment and time**

## 1. INSTRUCTIONS ON HOW TO COMPLETE THE QUESTIONNAIRE

Read the following carefully before filling in the details on the questionnaire.

1.1 Where applicable, the questions should be answered with an X

### EXAMPLE 1

Question: Who do you think appoints a mathematics educator?

**ANSWER**

SGB	1	
Minister of Education	2	X

The respondent has indicated that the Minister of Education appoints a Mathematics educator.

1.2 In some questions, you will be required to indicate on a five-point scale (marked 1-5), the extent to which you agree or disagree with the given statement. The following meaning is, for example, attached to the figure:

1 = strongly disagree

2 = disagree

3 = neutral

4 = agree

5 = strongly agree

### EXAMPLE 2

Statement: All educators teaching mathematics have the necessary mathematics qualifications

**Answer**

1	X	2		3		4		5	
---	---	---	--	---	--	---	--	---	--

The respondent strongly disagrees with the statement in this example.

- 2.3 Some questions will require that you indicate whether you agree or disagree with the statement.

**EXAMPLE 3**

Statement: Stakeholders outside the school play a leading role in the development of mathematics policy.

Agree		Disagree	X
-------	--	----------	---

The respondent indicated that he/she disagrees with the statement.

**EXAMPLE 4**

Often a question will have a mere “YES” of “NO” as an answer. However you could be asked to motivate your answer

Yes		No	
-----	--	----	--

**3. QUESTIONNAIRE TO PRINCIPAL, SCHOOL MANAGEMENT TEAM (SMT) AND MATHEMATICS EDUCATORS OF LONWABO HIGH SCHOOL**

- 3.1 Demographical (Personal details of respondents – Quantitative Data)

3.1.1 What rank/post do you hold?

Principal	1	
Deputy Principal	2	
Head of Department	3	
Other	4	

3.1.2 Indicate your age group, please

18-25	1	
26-30	2	
31-35	3	
36-40	4	
41-45	5	
46-50	6	
51-55	7	
55-60	8	
61-65	9	

3.1.3 Indicate your sex, please

Male	1	
Female	2	

3.1.4 Years of service with the Department of Education

Less than 5 years	1	
5 to 10 years	2	
11 to 15 years	3	
16 to 20 years	4	
More than 20 years	5	



3.1.5 My home language is:

English	1	
Afrikaans	2	
Xhosa	3	
Other	4	

3.1.6 Academic Qualification

My highest qualification is:

Standard 8 / Grade 10	1	
Matric / Grade 12	2	
Certificate(s)	3	
Diploma(s)	4	
Undergraduate degree(s)	5	
Post graduate degree	6	
Other	7	

**4. SPECIFIC QUESTIONS REGARDING THE REASONS BEHIND POOR PERFORMANCE IN MATHEMATICS BY HIGH SCHOOL LEARNERS**

4.1 Do you have a subject policy for Mathematics?

Yes		No	
-----	--	----	--

4.2 Do you consider Mathematics as an essential subject in the school curriculum?

Yes		No	
-----	--	----	--

4.3 Give a reason to support your answer in 4.2.

.....  
.....  
.....

4.4 There are enough textbooks and other learner and teacher support materials (LTSM) for learners and teachers.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.5 In your own opinion, do you think learners who enrol in Grade 8 have a better understanding of the basic mathematical principals and operations eg. Bodmas?

Yes		No	
-----	--	----	--

4.6 Are there subject committees in your school?

Yes		No	
-----	--	----	--

4.7 How often do departmental meetings take place?

.....  
.....

4.8 Do you have a Head of Department (HOD) for mathematics?

Yes		No	
-----	--	----	--

4.9 Are there enough qualified mathematics teachers in your school?

Yes		No	
-----	--	----	--

4.10 Is there proper supervision of work in your school? (Not at all / sometimes / always)

4.11 Does the School Management Team create a positive teaching and learning environment?

Yes		No	
-----	--	----	--

4.12 If your answer to 4.11 is YES, how is it done?

.....

.....

If your answer to 4.11 is NO, give reasons.

.....

.....

.....

4.13 Do you think your Mathematics teachers have the knowledge of the curriculum and learning programmes?

None of them		Some of them		All of them	
--------------	--	--------------	--	-------------	--

4.14 Is there lesson planning, preparation and presentation by mathematics educators?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

4.15 Is the consistent learner assessment in line with the work schedule?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

4.16 Are there professional development programmes and support in the field of work for mathematics educators in your school?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

4.17 Do Mathematics teachers spend additional time with learners who score below average in mathematics?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	-----------	--------------------------

4.18 Do mathematics teachers attend workshops organised by the district periodically?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

4.19 Is there a platform in place where mathematics teachers in your feeder schools liaise with your mathematics teachers to bridge content gaps?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

4.20 Does your school set achievement targets every year for all grades?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>
-----	--------------------------	----	--------------------------	-----------	--------------------------

4.21 Do you think mathematics teachers use variety of methods and approach for the teaching of the subject?

Yes		No	
-----	--	----	--

### HUMAN RELATIONS

4.22 Do you think good human relations contribute to effective teaching and learning and school development?

Yes		No	
-----	--	----	--

4.23 There is efficient and effective communication among all mathematics teachers in my school.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.24 How do you motivate mathematics educators and mathematics learners in you school?

.....

.....

4.25 Briefly explain the main root causes of poor performance in mathematics in your school?

.....

.....

4.26 What are your strengths at the moment in achieving good passes in mathematics in all grades?

.....

4.27 What do you think your school can do better to change the situation?

.....

.....

**Thank you for your commitment and time**

4. **QUESTIONNAIRE TO THE PRINCIPAL, THE SCHOOL MANAGEMENT TEAM (SMT) AND MATHEMATICS EDUCATORS OF TEMPLETON HIGH SCHOOL (BEDFORD)**

4.1.1 What is the language of teaching and learning in your school?

.....

4.1.2 Is there a Head of Department for Mathematics?

Yes		No	
-----	--	----	--

4.1.3 Do you consider mathematics as an essential subject in the school curriculum?

Yes		No	
-----	--	----	--

4.1.4 Give a reason to 4.1.3 above

.....  
 .....

**LEARNER AND TEACHER SUPPORT MATERIALS**

4.1.5 There are enough textbooks and other learner and teacher support materials in my school.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.1.6 Are the textbooks you use relevant and up to standard?

Yes		No	
-----	--	----	--

4.1.7 There are a variety of textbooks we use for teaching and learning.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.1.8 Are there mathematics workbooks for learners?

Yes		No	
-----	--	----	--

4.1.9 Mention other teaching aids besides textbooks used for the teaching and learning of mathematics in your school.

.....

.....

.....

4.1.10 Do you have a retrieval policy in your school?

Yes		No	
-----	--	----	--



4.1.11 How do you ensure that textbooks issued to learners are collected at the end of the year.

.....  
.....  
.....

**4.2 SUPERVISION, SUPPORT AND PROFESSIONAL DEVELOPMENT**

4.2.1 Is there proper supervision of educator and learners work at school by the Head of Department?

Yes		No	
-----	--	----	--

4.2.1 Supervision of work is done

Monthly		Bi-monthly		Termly		Not at all	
---------	--	------------	--	--------	--	------------	--

4.2.1 Are there subject committees in your school?

Yes		No	
-----	--	----	--

4.2.1 Do the subject committees function?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.1 Are proper records of supervision and minutes of all meetings kept?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.1 Are all the departments in your school working together towards the attainment of specific objectives?

Yes		No	
-----	--	----	--

4.2.2 Are there lesson-planning and preparation by all teachers before they go to classes?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.2 Does the Head of Department conduct class visits?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.3 Do you as the School Management Team ensure that all teachers attend workshops and NCS, CAPS training?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.4 Do you get support from subject advisors?

Always		Sometimes		Not at all	
--------	--	-----------	--	------------	--

**5. PREVIOUS ACHIEVEMENTS**

5.1 What were your percentage pass rates for the past three years in Grade 12 in mathematics?

.....  
.....

5.2 What do you think had contributed to these achievements?

.....  
.....

5.3 Have you analysed the results of learners in all the other grades in Dec. 2012?

Yes		No	
-----	--	----	--

5.4 Do you think there is an improvement in the teaching and learning of mathematics in your school?

Yes		No	
-----	--	----	--

6. **MOTIVATION**

6.1 How do you motivate your educators to work harder and achieve more everyday?

.....  
.....

6.2 How do mathematics educators in your school motivate learners to work harder in mathematics?

.....  
.....

6.3 Is there full participation in mathematics during teaching period by all learners doing maths?

Yes		No	
-----	--	----	--

6.4 What is the attitude of learners towards mathematics as a subject?

Positive		Negative	
----------	--	----------	--

**7. HUMAN RELATIONS**

7.1 Do you think good human relations contribute to the effective and efficient teaching and learning of mathematics in your school?

Yes		No	
-----	--	----	--

7.2 What do you do to learners who achieve far below average scores in mathematics?

.....

.....

.....

7.3 How do you describe human relations among your staff in your school?

.....

.....

7.4 Do teachers come to school with a positive attitude?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

7.5 How do you manage conflicts in your school?

.....  
.....

**7.6 CURRICULUM MANAGEMENT**

7.6.1 Does supervision take place?

Yes		No	
-----	--	----	--

7.6.2 Is the work of mathematics teachers controlled in line with departmental guidelines and work schedules?

Yes		No	
-----	--	----	--

7.6.3 Is there a system in place to check that there is complete syllabus coverage before learners write the end of year exams?

Yes		No	
-----	--	----	--

7.6.4 What approach(es) does/do mathematics educators in your school use in the teaching of mathematics that makes it easier for learners to understand?

.....  
.....  
.....

**8. LEARNER ASSESSMENT**

8.1 Is there a class work for learners every day?

Yes		No	
-----	--	----	--

8.1.1 Is there a homework for mathematics learners everyday?

Yes		No	
-----	--	----	--

8.1.2 How many times do you write tests per month?

.....

8.1.3 Are the tests controlled immediately?

Yes		No	
-----	--	----	--

8.1.4 Mention any skill which you possess which you think may improve/impact positively on the teaching and learning of mathematics.

.....  
.....

**Thank you for your co-operation.**

4. **QUESTIONNAIRE TO THE PRINCIPAL, THE SCHOOL MANAGEMENT TEAM (SMT) AND MATHEMATICS EDUCATORS OF SAKHULULEKA HIGH SCHOOL (FORT BEAUFORT)**

4.1.1 What is the language of teaching and learning in your school?

.....

4.1.2 Is there a Head of Department for Mathematics?

Yes		No	
-----	--	----	--

4.1.3 Do you consider mathematics as an essential subject in the school curriculum?

Yes		No	
-----	--	----	--

4.1.4 Give a reason to 4.1.3 above

.....

.....

**LEARNER AND TEACHER SUPPORT MATERIALS**

4.1.5 There are enough textbooks and other learner and teacher support materials in my school.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.1.6 Are the textbooks you use relevant and up to standard?

Yes		No	
-----	--	----	--

4.1.7 There are a variety of textbooks we use for teaching and learning.

Strongly disagree	1	
Disagree	2	
Neutral	3	
Agree	4	
Strongly agree	5	

4.1.8 Are there mathematics workbooks for learners?

Yes		No	
-----	--	----	--

4.1.9 Mention other teaching aids besides textbooks used for the teaching and learning of mathematics in your school.

.....

.....

4.1.10 Do you have a retrieval policy in your school?

Yes		No	
-----	--	----	--

4.1.11 How do you ensure that textbooks issued to learners are collected at the end of the year.

.....

.....



## 4.2 SUPERVISION, SUPPORT AND PROFESSIONAL DEVELOPMENT

4.2.1 Is there proper supervision of educator and learners work at school by the Head of Department?

Yes		No	
-----	--	----	--

4.2.1 Supervision of work is done

Monthly		Bi-monthly		Termly		Not at all	
---------	--	------------	--	--------	--	------------	--

4.2.1 Are there subject committees in your school?

Yes		No	
-----	--	----	--

4.2.1 Do the subject committees function?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.1 Are proper records of supervision and minutes of all meetings kept?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.1 Are all the departments in your school working together towards the attainment of specific objectives?

Yes		No	
-----	--	----	--

4.2.2 Are there lesson-planning and preparation by all teachers before they go to classes?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.2 Does the Head of Department conduct class visits?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.3 Do you as the School Management Team ensure that all teachers attend workshops and NCS, CAPS training?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

4.2.4 Do you get support from subject advisors?

Always		Sometimes		Not at all	
--------	--	-----------	--	------------	--

**5. PREVIOUS ACHIEVEMENTS**

5.1 What were your percentage pass rates for the past three years in Grade 12 in mathematics?

.....  
.....

5.2 What do you think had contributed to these achievements?

.....  
.....

5.3 Have you analysed the results of learners in all the other grades in Dec. 2012?

Yes		No	
-----	--	----	--

5.4 Do you think there is an improvement in the teaching and learning of mathematics in your school?

Yes		No	
-----	--	----	--

**6. MOTIVATION**

6.1 How do you motivate your educators to work harder and achieve more everyday?

.....

.....

6.2 How do mathematics educators in your school motivate learners to work harder in mathematics?

.....

.....

6.3 Is there full participation in mathematics during teaching period by all learners doing maths?

Yes		No	
-----	--	----	--

6.4 What is the attitude of learners towards mathematics as a subject?

Positive		Negative	
----------	--	----------	--

**7. HUMAN RELATIONS**

7.1 Do you think good human relations contribute to the effective and efficient teaching and learning of mathematics in your school?

Yes		No	
-----	--	----	--

7.2 What do you do to learners who achieve far below average scores in mathematics?

.....

.....

.....

.....

7.3 How do you describe human relations among your staff in your school?

.....

.....

7.4 Do teachers come to school with a positive attitude?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

7.5 How do you manage conflicts in your school?

.....

.....

7.6 **CURRICULUM MANAGEMENT**

7.6.1 Does supervision take place?

Yes		No	
-----	--	----	--

7.6.2 Is the work of mathematics teachers controlled in line with departmental guidelines and work schedules?

Yes		No	
-----	--	----	--

7.6.3 Is there a system in place to check that there is complete syllabus coverage before learners write the end of year exams?

Yes		No	
-----	--	----	--

7.6.4 What approach(es) does/do mathematics educators in your school use in the teaching of mathematics that makes it easier for learners to understand?

.....  
.....

**8. LEARNER ASSESSMENT**

8.1 Is there a class work for learners every day?

Yes		No	
-----	--	----	--

8.1.1 Is there a homework for mathematics learners everyday?

Yes		No	
-----	--	----	--

8.1.2 How many times do you write tests per month?

.....

8.1.3 Are the tests controlled immediately?

Yes		No	
-----	--	----	--

8.1.4 Mention any skill which you possess which you think may improve/impact positively on the teaching and learning of mathematics.

.....

.....

**Thank you for your co-operation**

5. **QUESTIONNAIRE TO LEARNERS OFFERING MATHEMATICS IN GRADE 12 CURRENTLY**

1. **INSTRUCTIONS ON HOW TO COMPLETE THE QUESTIONNAIRE**

Read the following carefully before filling in the details on the questionnaire.

1.1 Where applicable, the questions should be answered with an X.

**EXAMPLE 1**

Question: Do you have a mathematics teacher?

Yes	<input type="checkbox"/>	No	X
-----	--------------------------	----	---

The respondent has indicated that he/she has no mathematics teacher.

1.2 In some questions, you will be required to indicate on a five-point scale (marked 1-5), the extent to which you agree or disagree with the given statement. The following meaning is, for example, attached to the figure:

1 = strongly disagree

2 = disagree

3 = neutral

4 = agree

5 = strongly agree

**EXAMPLE 2**

Statement: The mathematics teacher does not normally miss his/her periods.

**Answer**

1		2		3		4	X	5	
---	--	---	--	---	--	---	---	---	--

The learner agrees with the above statement.

**EXAMPLE 3**

A question may have a “YES” or “NO” as an answer. However, you could be asked to motivate your answer.

**EXAMPLE:**

Question: Does the mathematics teacher complete the syllabus/work schedule before the end of year exams?

Yes		No	X
-----	--	----	---

Give reasons to support your answer.

The teacher is very slow and we do too many exercises on the same topic.

**5.1 DEMOGRAPHICAL DETAILS OF RESPONDENTS – QUANTITATIVE DATA**

5.1.1 In which grade are you?                      Grade .....

5.1.2 Indicate your age group, please

12-15	
16-19	
20-23	
24-27	
27 and above	



5.1.3 Indicate your sex.

Male	<input type="checkbox"/>	Female	<input type="checkbox"/>
------	--------------------------	--------	--------------------------

## 5.2 CHOICE OF MATHEMATICS AS A SUBJECT

5.2.1 Why have you chosen mathematics as part of your subjects? Give reason.

.....  
.....  
.....

5.2.2 What is your future career?

.....

5.2.3 Do you think mathematics is a requirement to pursue your career?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

5.2.4 Do you think mathematics is a good subject.

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

## 5.3 ABOUT THE MATHEMATICS TEACHER

5.3.1 Do you have a mathematics teacher?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

5.3.2 Is he/she a good teacher?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

5.3.3 How do you rate your mathematics teacher?

1		2		3		4		5	
---	--	---	--	---	--	---	--	---	--

1 = Very poor 2 = Poor 3 = Average 4 = Good 5 = Very good

5.3.4 I have a good attitude towards the mathematics teacher.

True		False		Sometimes	
------	--	-------	--	-----------	--

5.3.5 Is the mathematics teacher fast or slow in teaching?

.....

5.3.6 Do you think he/she will complete his/her syllabus/work schedule at the end of the year before you write your final exams?

Yes		No		Not Sure	
-----	--	----	--	----------	--

5.3.7 Does the teacher pay attention to slow learners?

Yes		No	
-----	--	----	--

5.3.8 Do you think the maths teacher is committed to his work?

Yes		No	
-----	--	----	--

5.3.9 Do you understand his lessons?

Yes		No		Sometimes		Not at all	
-----	--	----	--	-----------	--	------------	--

#### 5.4 LEARNER PERFORMANCE IN MATHEMATICS

5.4.1 Do you have sufficient text books in maths?

Yes		No	
-----	--	----	--

5.4.2 Do you practise maths everyday?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

5.4.3 Are you doing well in mathematics?

Yes		No		Sometimes	
-----	--	----	--	-----------	--

5.4.4 What is your attitude towards mathematics?

Positive		Negative	
----------	--	----------	--

5.4.5 What do you think has contributed to your performance in mathematics?

Explain

.....

.....

.....

5.4.6 What do you think should be done by your school to further improve your performance in mathematics?

.....

.....

5.4.7 Would you recommend learners in Grade 9 to choose mathematics when they are in Grade 10?

Yes		No	
-----	--	----	--

**Thank you for participating in this exercise.**