THE INFLUENCE OF THE PASS MARK ON THE CHOICE OF MATHEMATICS AS SUBJECT BY GRADE 10 LEARNERS IN THE GROOT LETABA CIRCUIT

by

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DECLARATION

I, Somisa Joyce Magwaza, declare that the dissertation entitled "*The influence of the pass mark on the choices of Mathematics as a subject by Grade 10 learners at Groot Letaba Circuit* is my own work. All the sources that I have used or quoted in the dissertation have been rightfully acknowledged by means of complete references.

Signature……Date 01-07-2021 ……

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DEDICATION

I am dedicating this dissertation to my beloved parents,

the late Mr Wilson and Mrs Zabeta Mabunda.

May your souls rest in peace.

I love you!

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ABSTRACT

The main problem identified for this study relates to the low numbers of learners who choose Mathematics as a subject in Grade 10 in many schools of the Groot Letaba Circuit, Limpopo Province. The purpose of this study was to explore how the pass mark influences the choice of Mathematics as a subject by Grade 10 learners. This study is situated within the constructivist paradigm. Constructivism is based on the belief that reality is subjective and multiple which means that people with their assumptions, experiences and backgrounds contribute to the establishment of reality. This study followed a qualitative research approach nested in a phenomenological research design. Attribution Theory, advocated by Fritzs which is concerned with how individuals interpret events and how this relates to their thinking and behaviour, supported the research. Purposive sampling was used to select four teachers and 20 Grade 10 learners from four secondary schools in the Groot Letaba Circuit of Limpopo Province. Individual interviews were conducted with teachers and learners participated in focus group interviews, both of which permitted the researcher to obtain rich information. The Thematic Method of data analysis was used to analyse the data. The findings revealed that the low marks obtained by learners in Grade 9 influenced them to reject Mathematics as a subject in Grade 10 because they fear failing mathematics again in subsequent grades. The findings also revealed that by providing sufficient time for teaching mathematics, implementing effective teaching methods and using applicable resources, learners should be motivated to work hard and attain the necessary pass mark require to choose Mathematics as a subject in Grade 10.

Keywords: Mathematics, influence, choice, learner, pass mark, curriculum, teacher, performance, Grade 10.

LIST OF ACRONYMS

CAPS	Curriculum and Assessment Policy Statement
DAC	Department of Arts and Culture
DBE	Department of Basic Education
DoE	Department of Education
DSG	Developmental Support Group
FET	Further Education and Training
GCE	General Certificate of Education
LoLT	Language of Learning and Teaching
NCS	National Curriculum Statement
NPPPR	National Policy Pertaining to the Programme and Promotion Requirements
NSC	National Senior Certificate
OECD	Organisation for Economic Co-operation and Development
PanSALB	Pan South African Language Board
PCK	Pedagogical Content Knowledge
RNCS	Revised National Curriculum Statement
SABC	South African Broadcasting Corporation
SCK	Subject Content Knowledge
RSA	Republic of South Africa
SMT	School Management Team
TIMSS	International Mathematics and Science Study

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CHAPTER 1

BACKGROUND AND OVERVIEW

1.1 INTRODUCTION

Mathematics is regarded as the single most important subject and is viewed as more than just an academic subject. Mathematics is highly regarded and useful not only for higher education, skilled jobs and the national economy (Justina, 2003), but also for developing logical and critical thinking. Achievement in Mathematics is valued as the most reliable pointer for measuring economic, social, geographical and political development of the world (Justina, 2003). Betiku (1999) describes Mathematics as the cornerstone of science, which is vital for economical, technological and industrial development. According to the Grade 10 to 12 National Curriculum Statement (NCS), adequate skills and knowledge of Mathematics and Physical and Life Sciences are a basic and required element for successful current life and socio-economic transformation (DoE, 2003). Therefore, knowledge of Mathematics opens opportunities for learners and makes them marketable in this increasingly technological and competitive society. This means that globally, there is a significant call for the provision of quality Mathematics education (Igbokwe, 2000).

In South Africa, Mathematics is a compulsory subject from Grades R to 9. Despite the importance of Mathematics, many learners in South Africa do not qualify to continue with Mathematics in secondary schools from Grade 10 because they have been unable to achieve the Grade 9 Mathematics pass mark (Feza-Piyose, 2012). The concept ‘pass mark’ refers to the promotion and progression requirements for each subject set by the Department of Basic Education (DBE, 2011). The National Curriculum Statement, Grades R-12, which contains the promotion and progression requirements, was endorsed as a national policy and widely published in the Government Gazette 3 4600, Notices 722 and 723 of 12 September 2011. As from 2011, the Department monitored the implementation of the new requirements in the various provinces of South Africa. In 2014, the findings of the Task Teams formed by the Minister of Education, revealed that the new promotion requirements were

negatively affecting the academic performance of learners at school level. According to the Department of Basic Education (South African Government News Agency, 2017) the new promotion requirements, which was considered the benchmark, were not aligned with the National Senior Certificate (NSC) and this had an effect on the performance of learners. Therefore, there was a need to evaluate the promotion requirements for the Foundation, Intermediate and Senior Phases with the Further Education and Training (FET) Band.

To minimise the impact of the higher promotion requirements in the Senior Phase, the Department issued the National Assessment Circular 3 of 2015 to allow for the adjustment of marks (DBE, 2017). In 2016, given the negative effect of the compulsory pass requirement of Mathematics at 40%, a special adjustment condonation, or relaxation of promotion requirements (DBE, 2011), was applied. According to the adjustment, learners who pass all other subjects but fail Mathematics with a minimum mark of 20% are given a condonation and would thus pass Mathematics and the examination as a whole. The Department therefore proposed dropping the requirement for Grades 7, 8 and 9 to pass Mathematics (DBE, 2011). In order to be promoted to either Grades 7, 8 and 9, learners need to achieve a mark of 50% in the Home Language, 40% in the First Additional Language, 40% in Mathematics, 40% in any three of the other required subjects and 30% in any two of the other required subjects, as specified in the National Policy pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R-1 (DBE, 2011). The challenge now facing the education system and thus the country as a whole, is that very few learners choose Mathematics as a subject in high school. The aim of the study is therefore, to explore the influence that the pass mark has on the choice of Mathematics as a subject by Grade 10 learners.

1.2 PROBLEM STATEMENT

The low number of learners who choose to take Mathematics in the FET Phase from Grade 10 onwards is a concern in the Groot Letaba Circuit. Learner participation in Mathematics and success achievement in Grade 10 is low (DBE, 2017). Previously learners were unable to achieve the prescribed pass mark which, at Grade 9 level is 40% (Lepodise, 2017) and these learners who had failed Mathematics by scoring below 40%, would fail the grade. However, given the high number of learners who

were at risk of being held back because of their Mathematics scores, the Department implemented the adjustment condonation for learners who attained a minimum of 20% in Mathematics (Lepodise, 2017). This means that learners who pass all other subjects but failed Mathematics with a minimum of 20% are condoned. Despite this condonation, the number of learners who choose Mathematics in Grade 10 is low. This low number has a knock-on effect in that there are few learners writing Mathematics in Grade 12. This has a negative impact on the country's economy and development resulting in shortages of engineers, scientists, economists, technologists which is contrary to the demands of Fourth Industrial Revolution (4IR). South African schools require more learners to take Mathematics and Mathematics-related subjects to ensure that the youth are equipped to take on these professions.

In the years 2016 to 2018, the number of South African learners writing the National Senior Certificate (NSC) dropped (Reddy, Isdale, Juan, Visser, Winnar & Arends 2019). In 2016, 265 810 learners wrote Mathematics but in 2017 there was a decline of more than 20 000 with around 245 103 learners writing Mathematics with more than half (51.9%) of the learners obtaining 30% and more in the examination. In 2018, 128 000 learners obtained less than 30%, a target that is unrealistically low because a learner who obtains 30% can hardly be categorised as someone who has mastered the subject (South African Mathematics Foundation, 2018). It is therefore necessary to conduct an investigation to establish how the pass mark influences the choice of Mathematics as a subject by learners going into Grade 10.

1.3 MOTIVATION OF THE STUDY

The researcher is motivated to conduct this study because few learners take Mathematics in Grade 10. Over the years, I have observed that Mathematics in many schools in the Groot Letaba Circuit is not a choice subject for learners going into Grade 10, compared to other subjects. Very few learners pass Mathematics in Grade 9, even those who pass Mathematics in Grade 9, do not take Mathematics in Grade 10. The high recorded failure rate in Mathematics at Grade 12-level over the years has tended to contribute to the low number of learners choosing Mathematics as a subject in Grade 10 (South African Government News Agency, 2017) as well as a negative attitude towards the subject. The researcher is motivated to conduct this study in order

to investigate whether the pass mark of Mathematics contributes to the choice of Mathematics as a subject in Grade 10. The poor Mathematics performance of South African learners has been confirmed by the Trends in International Mathematics and Science Study (TIMSS) over a number of cycles. TIMSS, a project of the International Association for the Evaluation of Educational Achievement (IEA), assesses how well learners in various countries are able perform in Mathematics and Science at different stages of their education (Reddy *et al.,* 2016). Assessments are usually conducted with Grades 8. Thirty-six countries participated in TIMSS 2015 at the Grade 8 level and three countries at the Grade 9 level (Norway, Botswana and South Africa) (Reddy *et al.,* 2016).

The TIMSS achievement scale is set with a centrepoint of 500. The top five ranked countries were from East Asia – Singapore (621), the Republic of Korea (606), Chinese Taipei (599), Hong Kong SAR (594) and Japan (587) for mathematics with the five lowest performing countries being Botswana (391), Jordan (386), Morocco (384), South Africa (372) and Saudi Arabia (368) (Reddy *et al.,* 2016:2). The percentage of learners who achieved intermediate, high or advanced international benchmark levels is concerningly low. In the lowest performing countries, such as South Africa, between half and two-thirds of the learners scored below 400 points, which means they did not achieve the minimum competency and less than 20% of learners scored above 475 points (intermediate benchmark). Only 1% of South African learners scored in the advanced category (>625 points) (Reddy *et al.,* 2016:2). At the advanced international benchmark level, learners are expected to apply and reason in a variety of problem situations (for example; number operations percentages, fractions and geometry), solve linear equations and make generalisations (Reddy *et al.,* 2016). In contrast, some 54% of Singaporean Grade 8 Mathematics learners achieved the advanced benchmark level, a very high value compared to the mere 1% of South African Grade 9 learners.

1.4 RESEARCH QUESTIONS

In unearthing of the problem described above, this study is guided by the following main research question: *How does the pass mark influence the choices of Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit?*

The above overarching question is realised by the following sub-questions:

1. What are the benefits of learning Mathematics?
2. What is the role of the pass mark?
3. What is the influence of the pass mark on the choice of learners of Mathematics as a subject in secondary schools?
4. Which strategies can be implemented to motivate learners to choose Mathematics as a subject in Grade 10?

1.5 AIM AND OBJECTIVES OF THE STUDY

The main aim of this qualitative study is to explore how the pass mark influences the choice of Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit.

The study objectives are:

1. To investigate the benefits of learning Mathematics.
2. To understand the role of the pass mark.
3. To explore the influence of the pass mark on the choice of learners in Mathematics as a subject in secondary schools?
4. To suggest strategies that can be used to motivate learners to choose Mathematics as a subject in Grade 10 in Groot Letaba circuit.

1.6 SIGNIFICANCE OF THE STUDY

The outcome of this study hopefully sheds light on specific actions for important implications for various stakeholders of schools in the Limpopo Province and possibly South Africa. The researcher believes that this study serves to develop a positive attitude towards Mathematics by understanding how the role of the pass mark influences learner's choice of the subject. Developing a positive attitude towards Mathematics may encourage and motivate learners to take Mathematics in larger numbers for the FET Phase. This study might offer suggestions and strategies in

creating good climate and culture towards Mathematics and bring eagerness and desire to learners so that they study and perform well in Mathematics. Once learners adapt to the mood of progress and success, they gain confidence and become more engaged in their studies. Mathematics is a fundamental prerequisite for many opportunities with regard to scientific and technological orientation. The meaningful participation of more learners in Mathematics will offer them access to more job opportunities and also alleviate the shortage of scientists and engineers such as surveyors, engineers and astronomers in the country.

This study informs teachers in using teaching methods and strategies that motivate learners to study Mathematics. The use of new approaches and strategies assist teachers in creating an atmosphere conducive to the teaching and learning of Mathematics and facilitating its teaching so that learners become more engaged in Mathematics. The findings of this study also assists the Department of Education in the promulgation of new legislations and policies which will not only improve the number of learners who learn Mathematics but also their performance.

1.7 DEMARCATION OF THE STUDY

The demarcation of the study refers to the creation of the borders of the research problem area within which the research will be conducted (Babbie, 2014). This study will be conducted in five secondary schools in the Groot Letaba Circuit of the Mopani District, in the Limpopo Province. Limpopo Province consists of five districts, namely, Capricorn, Mopani, Sekhukhune, Vhembe, and Waterberg (Pauw, 2005). Figure 1.1 below, illustrates the various districts of Limpopo Province, shaded with various colours, and their municipalities. Figure 1.1 below indicates that the five districts are in turn divided into twenty-five local municipalities, namely; Aganang. Blouberg, Lepelle-Kumpi, Ba-Phalaborwa, Greater Giyani, Greater Letaba, Greater, Elias motsoaledi, Ephraim Mogale, Fetakgomo, Greater Tubatse, Makhuduthamakga, Makhado, Musina, Mutale, Thulamela, Belabela, Lephalale, Modemolle, Mokgalakwena, Mokgophong, and Thabazimbi. The Mopani District is located adjacent to the Kruger National Park (Mopani District Municipality, 2014).

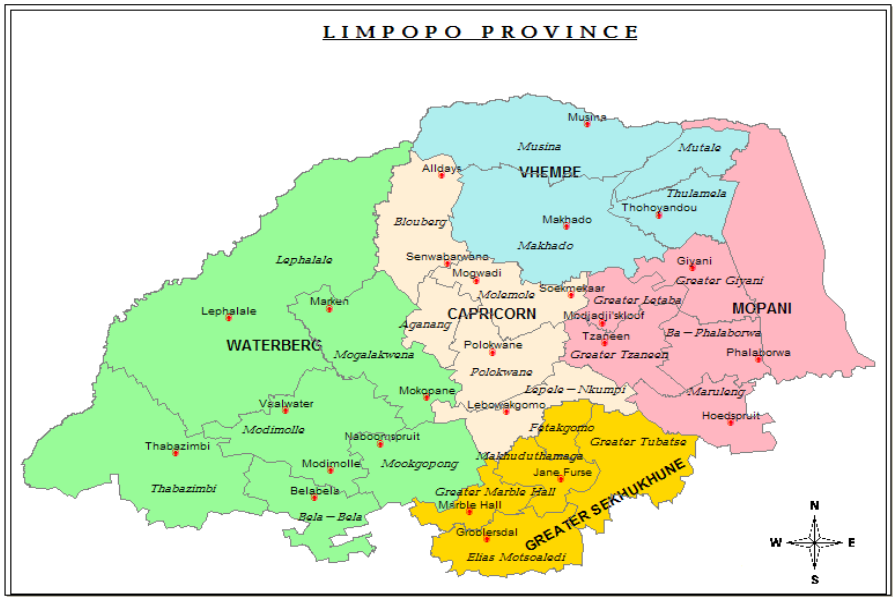

Figure 1.1: Districts and municipalities of Limpopo Province

Four schools were purposively selected from the Groot Letaba Circuit in the Mopani District of Limpopo Province. One teacher and four learners were also selected purposively from each of the four schools to participate in the interviews.

1.8 REARCH DESIGN AND METHODOLOGY

The concept research methodology refers to mechanism of choosing set of specific methods, procedures, techniques in a research study to gather and analyse data (Wahyuni, 2012) while (Rahi, 2017) describes research methodology as the grouping of strategies to achieve credible, valid and reliable understanding of the phenomenon and processes in a specific field. This section focuses on the research paradigm, the research design and approach, the population and sampling, as well as data collection and data analysis of the study.

1.8.1 Research Paradigm

According to (Wahyuni, 2012), the concept ‘research paradigm’ refers to the researcher’s beliefs and assumptions about the world. A research paradigm is therefore important for guiding the researcher to conduct the whole research process. All the activities of the researcher during the research process, such as the framing of research questions, design of the study, research approach, research methods and data collection are determined by the researcher’s interpretation of the world

(Wahyuni, 2012). This study applied a constructivist paradigm as it makes meaning through engaging the world without verification by measuring.

1.8.2 Research Approach

Three types of advanced research approaches are used in research, that is, quantitative, qualitative and mixed methods approaches (Creswell, 2014). This study followed a qualitative research approach which is an inquiry procedure of interpreting a particular social or problem associated on creating a complicated picture, complete opinions and conducted in a natural context. (Creswell, 2014). Qualitative research is preferred because it offers information which is normally spoken or written words of the people in their daily lives (Brynard & Hanekom, 2014).

1.8.2 Research Design

Research design refers to guidelines and instructions that must be used by the researcher to direct the study in answering the research problem (Mouton, 2002) or the whole procedure of research starting from conceptualising a research problem to narrative writing (De Vos, Strydom, Fouché & Delport, 2002). The process of selecting techniques is in order to manage and direct the study in accordance with the sampling size and data procedures (Maree, 2016). A qualitative phenomenological research design was applied to explore how the pass mark influences the choice of Mathematics as a subject by Grade 10 learners.

1.8.2.1 Population and sampling

All items, objects and events found in the research study constitute a population (Kothari, 2004), which should contain similar characteristics (Mouton, 2002). This study population consisted of all Grade 10 Mathematics teachers and Grade 10 learners in the Groot Letaba Circuit in the Mopani District of Limpopo Province. Sampling can be defined as the mini portion in the population taken to represent the whole population group (Pandey & Pandey, 2015). There are two major groups of sampling identified by (Maree, 2016), namely the probability and non-probability sampling. Within non-probability sampling falls convenience sampling, quota sampling, snowball sampling and purposive sampling (Maree, 2016). In this study, purposive sampling was used to allow the researcher to select the sample with a

specific purpose for the study (Maree, 2016) understanding that the participants would offer rich data to ensure that the objectives of the study are realised. The sampled participants were four mathematics teachers, with at least five years and above teaching Mathematics in Grade 10, and 20 Grade 10 learners selected from the four sampled secondary schools in the Groot Letaba Circuit in the Mopani District.

1.8.2.2 Data collection and analysis

Interviews and focus group discussion were conducted to collect data for the study guided by interview schedule in an attempt to answer the research questions. As defined by (Creswell, 2014), these data collecting strategies give detailed information and create a relationship with the participants to ensure rich data for the research. Data analysis is defined as studying the organised information in order to understand the inherent facts. The analysis of qualitative data requires the process of coding and it is conducted by means of preparing organising, examining and perusing through all transcripts cautiously and making notes on the margins (Creswell, 2014). A thematic method of qualitative data analysis was used to interpret the data to elicit a better understanding of the phenomenon under study. Coding is a concept used by researchers in processing and organising specific aspects of the data that is associated in answering the research question, with chunks of data being organised into units (Braun & Clarke, 2016). Coding of data began with identifying and analysing the unit and categories, comparing and continuously refining until provision is made for the identification of important categories which were then sorted in accordance with the meaning that they provided.

1.9 DEFINITION OF KEY CONCEPTS

In this section, the key concepts that appear throughout the study are defined, for the purpose of assisting the reader in comprehending the contexts in which they are used.

(a) Mathematics

The Department of Basic Education (2011) describes Mathematics as a language that uses and translates symbols and notations for interpreting numerical, geometric and graphical relationships. Elaine (2014) defines Mathematics as the science that uses logic of shape, quantity and arrangement, while (Yadav, 2017) describes it as a scientific language to investigate abstract structures and make use of their patterns

and properties. In this study, Mathematics is defined as a scientific language that makes use of symbols and notations to describe numerical, geometric and graphical relationships (DBE: CAPS, 2011)

(b) Learner

The South African Schools Act Number 84 of 1996 refers the concept “learner” to any child or an adult, who is receiving education at any educational institution such as an ECD centre, school or ABET centre (DoE, 1996). According to (Maree and Prinsloo, 1997), the concept “learner” means a person who learns or a person who is engaged in some form of study, which is the case in this study.

(c) Pass mark

According to the (Oxford Advanced English Dictionary, 2014), the concept ‘pass mark’ means the minimum mark which is required to pass an examination or the number of points that must be achieved in order to be successful in an examination. (South African Government News Agency, 2017), defines pass mark as the promotion and progression requirements of subjects in schools. In this study, the pass mark for Mathematics at FET level is pegged at 30%.

(d) The curriculum

The concept curriculum is derived from a Latin word *currere,* which means to run or course of study (Billings & Halstead, 2012). According to (Tanner and Tanner, 1975), the term curriculum is described as the programme planned for instructional purpose and is designed to assist learners in developing their individual capability. Duminy and Songhe (1980) on the other hand, describe curriculum as what is to be learned and, in this study that is the FET Mathematics curriculum.

(e) Teacher

A teacher refers to a person who is involved in teaching others at various levels of education or training, which includes formal and informal teaching, for example, parent teacher, lecturer, pastor and youth counsellor (DoE, 1997). According to the National Education Policy Act, Act No. 27 of 1998, the concept teacher refers to any individual

who presents lessons to learners, teaches information or trains people at any educational institution or provides educational services or support services to people (DoE, 1998). In this study the focus is on the Mathematics teacher.

(f) Learner performance

The concept 'learner's performance' refers to the level in which a student or learner, achieves his/her long or short-term educational goals (Ward, Stoker & Murray-Ward, 1996). According to (Bell, 2004), learner performance is the extent to which a learner is able to meets the requirements needed. Wesslen and Maria (2005) refer to learner performance as the learner's ability to exercise and demonstrate the knowledge in classwork activities and homework, assignments, tests, practical test, presentations, projects, discussions and examinations. Therefore, learner performance describes how well a learner performs in school subjects like Science, English, Geography and History, and particularly Mathematics in this study.

(g) Poor performance

According to Curriculum and Assessment Policy Statements (CAPS) poor performance refers to a score below 50% in Home language, 40% in First Additional language, 40% Mathematics and any other two subjects (DBE, 2010). In the school environment, performance is assessed in many ways. Teachers assess learner's understanding of knowledge through written and oral tests, presentations, homework, class activities, projects and examinations. Teachers assess in the form of writing a report and side notes to describe how well a learner has done. In this study, poor performance refers to a consistent failure by a learner to meet specified standards and levels of performance (Karande & Kulkarni, 2005)

(h) Learning

According to (Woofolk, 2010), learning is a process through which experience causes permanent, deliberate or unintentional change in knowledge or behaviour. According to (De Houwer, 2009), learning is the act, process or experience of gaining knowledge or skills. Cobb, Yackel and Wood (2009) describes learning as a lifelong process of transforming information and experience into knowledge, skill, behaviour and attitude. In other words, learning means to make particular contents one's own or to master

valuable experience, conduct and competency in certain skills. Learning is therefore not limited to school because we learn every day of our lives although in this study, learning refers to developing competence in Mathematics.

(i) Attitude

Attitude is described as a feeling that a person embraces towards certain things, for example a place, situation or other person (Swanepoel, Erasmus & Schenk, 2008). This research explores the attitude of learners towards learning Mathematics.

(j) Choice

Choice is described as a process of decision making to decide which opinion they regard as the best one. Choice is therefore best described as the outcome by the result of a process which involves the stages of assessment and judgement (Beresford & Sloper, 2008). To make a choice requires the evaluation of different opinions and as a result, to make a decision on which opinion is the best one to choose. Important to note is that for there to be a choice or a decision, there must be alternatives that are presented to the person making the choice. The process of choice therefore involves some sort of cognitive skill because the alternatives or available options must, as a requirement, have a positive value to qualify as an alternative (Beresford & Sloper, 2008). According to the Department of Basic Education (DBE, 2011), at the end of Grade 9 learners should choose between the subjects of Mathematics and Mathematics literacy to continue into the FET Phase.

(k) Influence

Influence is described as a force that one person who can be termed as the agent exerts on another person whom can be termed the target. The force exerted by the agent is intended to induce a change in the mindset of the person known as the target. The inducement can take place by various forms; it can be a change in behaviour, attitude, opinions, goals as well as values. In simpler terms, influence is therefore the ability of one person to affect the behaviour of another person and steer that person in a particular direction (Barret & Hall, 2006).

1.10 CHAPTER OUTLINE

The dissertation consists of the following five chapters:

Chapter 1: Introduction and background

Chapter one consists of, amongst others, the introduction and background to the study; problem statement; research questions, aims and objectives; rationale of the study; significance of the study, brief summary of research design and methodology and research outline and clarification of key concepts used throughout the study.

Chapter 2: Literature review

In this chapter, the researcher presents a literature review, theoretical framework and conceptual framework of the study. The researcher made use of primary and secondary sources. The literature review focuses on an extensive review of relevant literature such as the latest dissertations, monographs, textbooks on the subject, articles and journals and published nationally and internationally.

Chapter 3: Research methodology and design

The aim of this chapter is to present research design and methodology. The chapter includes research paradigm, research design, research approach, which includes research procedures, data population and sampling, data collection and data analysis and builds on the basic outline given in Chapter 1 (Creswell, 2014).

Chapter 4: Research findings, analysis and interpretation

This chapter focuses on the empirical research and outlines the research findings, data analysis and interpretation. In this chapter, the researcher presents and elucidates the responses of the respondents by means of charts and tables, which are accompanied by a detailed analysis and interpretation. In addition, a thematic method of data analysis (Creswell, 2014) is used to analyse the qualitative data and interpret the data in order to reflect until a better comprehension of what is meant is acquired.

Chapter 5: Conclusions

Chapter five summarises the whole research. It gives details and offers conclusions on the literature review and the major findings. In addition, it highlights implications and offers recommendations (Kent, 2001).

1.11 SUMMARY

The aim of this study was to explore how the pass mark influences the choice of Mathematics as a subject by Grade 10 in the Groot Letaba Circuit. Chapter one focused on the background of the research, the research problem, research questions, research aims, rationale of the study, demarcation of the study, summary of research design and methodology, definition of concepts and the chapter outline. The low number of learners who study Mathematics and their poor performance in secondary schools at the Groot Letaba Circuit motivated the researcher to conduct the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter (Chapter 1) focused on the background to the study, problem statement, research questions, aims and objectives and research design and methodology of the study. The aim of this chapter (Chapter 2), is to review various sources of literature. The concept “literature review” refers a scrutiny of books, academic articles and other sources appropriate to a particular issue, field of study or theory and in so doing, provides an elucidation, synopsis and analytical assessment of these works (Ramdhani, Ramdhani & Amin, 2014). Chapter two provides amongst other things, a summary of the sources analysed on the influence of the pass mark on the choice of Mathematics as a subject by Grade 10 learners in South Africa and internationally. The literature review includes the theoretical perspective, significance of Mathematics in schools and the influence of learners’ attitudes in choosing Mathematics as a subject for Grade 10 and the FET Phase. The chapter provides an analysis of appropriate literature such as significant books, journals and current articles on the subject, monographs and dissertations both national and international.

2.2 THE ADVANTAGES OF LEARNING MATHEMATICS

There are several advantages to the learning Mathematics. According to the Department (DoE, 2003), the acquisition of knowledge and development of skills in Mathematics contribute to a prosperous modern existence and socio-economic transformation. Mathematics prepares the citizens for the skills of numbers that are required by contemporary enterprises and lays a strong foundation for lifelong learning (Manoah, Indoshi & Othuon, 2011). Mathematics offers an entry into prospective occupations or careers in various fields such as physical science, computer science, life science, environmental science or technology (Pandor, 2006). Competence in Mathematics is crucial in preparing citizens with numeracy competence needed by science, enterprises and technology (House, 2006). Knowledge of Mathematics influences individual development through expanded comprehension and effective implementation of its knowledge and skills, while preserving suitable ethics and

character (DoE, 2003). Learners are therefore equipped with Mathematical knowledge and skills for progression in technology and science. This means that broadly speaking, Mathematics creates the foundation of numerous sciences, such as psychology, astronomy, engineering and physics. Despite this apparent need, increasingly few learners choose Mathematics as a subject in the FET Phase, as revealed in studies conducted by (Köğce, Yıldız, Aydın and Altındağ, 2009), Feza-Piyose (2012) and Ready *et al.* (2019) with could be due to learners' poor performance in the Grade 9 end-of-year assessment which falls to reach the pass mark.

2.3 THEORETICAL PERSPECTIVE

This research is guided by the Attribution Theory, which originated with Fritzs Heider at the beginning of the 20th century and was consequently enhanced by Harold Kelley and Bernard Weiner (Kasin, Fein & Markus, 2013). The term 'Attribution' is a social psychology concept which addresses the procedures whereby people describe the origin of particular behaviour and occurrences. The term attribution clarifies the cognitive procedure whereby an individual understands the origin of what has transpired to him or her, which was caused by himself or herself or by other people (Asonibare, 1986). The Attribution Theory focuses on how people explain occurrences and how it is related to their perception and conduct. (Kasin *et al,* 2013) asserts that a person can make two attributions, namely, internal and external attributions. That is, we succeed or fail because of factors that we hope possess with their origin being with us or because of factors that originate in our surroundings.

Internal attribution refers to the assumption that an individual behaves in a particular manner due to something about the individual (Kasin *et al.,* 2013); for instance, unsatisfactory performance of learners in Mathematics may be caused by lack of confidence towards learning the subject. This view refers to the degree to which people are confident that they are able regulate occurrences that influence them. The people who possess an inward location of control possess confidence that occurrences are caused mainly by their own activities. External attribution on the other hand, is the inference that persons behave in a certain way because of something about the situation in which they find themselves (Kasin *et al.,* 2013); for example, learners who fail Mathematics blame the pass mark or promotional requirements. The

people who possess an external location of control are confident that other people, for example, learners fortune, misfortune or mishap, primarily regulate occurrences (Vijayashree & Jagdischchandra, 2011). According to (Tachie and Chireche, 2017), a significant presumption of the attribution theory is that people will clarify their territory in order to sustain a positive self-introspection. That is, we will ascribe our victory or failure to aspects that authorise us to perceive ourselves in the best positive light possible. Attribution can also be used to clarify the distinction in stimulation between high and low performers. Attribution theory indicates that high performers will preferably avoid duties associated with succeeding, because they trust that achievement is due to high competence and endeavour (Kasin *et al.,* 2013). This shows that our attributions are directed by our spiritual or motivational desire.

(Kasin *et al,* 2013) indicate that Heider differentiated between two categories of attribution, namely the interpersonal attribution and explanatory attribution. The interpersonal attribution occurs when the sources of the occurrences are related to two or more people (Jaspars, Fincham & Hewstone, 1987). Individuals establish explanatory attribution to comprehend the universe around them and to search for grounds for a specific occurrence. For example, if the teachers encounter challenges in teaching learners, they may blame that on an absence of instructional support. In this research, the Attribution Theory by Harold Kelley and Weiner is applicable to this study because the learners probably attribute their selection of Mathematics as a subject to exterior circumstances such as an extremely high pass mark, complication of Mathematics, incompetence of teachers and to internal circumstances such as not being diligent or possessing a negative attitude towards Mathematics. The major problem facing the teachers is to motivate the learners to love Mathematics in order to enable them to recognise the significance and value of Mathematics.

2.4 THE ROLE OF THE PASS MARK

Grading systems globally are vastly different because every country has its own understanding of what it means to pass and to fail. In addition, countries create a pass mark threshold through the use of various grading systems. Austria describes performance levels in terms such as ‘satisfactory or very good’ while South Africa and other countries use percentage grading. In Singapore, the classifying system is

controlled by the Cambridge GCE high grade examination. India and Ireland have set their pass mark at 40% sequentially while countries like China, Japan have set the pass mark at 60% (Wedekind, 2013). Brazil uses what is termed a double letter grading system, which utilises a combination of an expressive and percentage grading system. Their pass mark is set 30% for certain levels and 40% for others. In African countries, a range of classifying systems are used: Kenya uses a descriptive grading system as there are three categories of secondary schools in Kenya. Kenya has no failure mark because even the student with the lowest mark is given a point, but the pass mark threshold is set at 40%. Tanzania uses the 7-4-2 score (Wedekind, 2013). Botswana's pass mark is set at 40%. Many countries interpret the pass mark the same, whether it is a mark, grade or scale. Learners have to achieve a certain level or a mark so that they are upgraded to the next grade.

According to the Organisation for Economic Co-operation and Development (OECD), South Africa possesses the lowest tertiary requirement across all OECD and partner countries (OECD, 2019). The pass mark in South African public schools is currently set at 30% which means that a learner will only be considered to have failed should they obtain less than the current threshold. The 30% pass mark set in South Africa is extremely low which has had an adverse effect on the entire education system (Education Series Volume 3, 2016). According to (Wedekind, 2013), the criticism of the education system of South Africa resulted in the pass mark being changed but it is widely held that current pass mark creates inferiority in the whole education system. It is suggested that the pass mark must in accordance with most countries and thus be raised to at least 50% (Wedekind, 2013).

The major purpose of this research is to explore how the pass mark influences the choice of Mathematics as a subject by Grade 10 learners in Groot Letaba Circuit. The concept 'pass mark' refers to the promotion and prerequisites of progression of schools (DBE, 2017). It is the number of points that must be achieved in order to be successful in an examination or a level needed in order to succeed in an examination. Pass mark or progression prerequisite are the marks that must be obtained by the learners so that they are promoted to the next grade. According to the South African National Policy on the programme and progression prerequisites of the Grade R to 12 National Curriculum Statement, for the purpose of passing grade 9, a learner needs

to meet certain requirements. The following table indicates the minimum requirements to pass Grade 9 (DBE, 2012)

Table 2.1: Minimum requirements to pass Grade 9

Subject	Minimum Requirements	
	Level	%
Home Language	4	50
First Additional Language	3	40
Mathematics	3	40
Any other three subjects	3	40
Any other three subjects	2	30

Table 2.1 above indicates that in order to progress to Grade 10, a student must comply with the above prerequisites. The last column of the table indicates the pass mark which must be achieved in order to be promoted to Grade 10. In order to pass Mathematics at secondary school level, the learner must obtain 40%. In 2016, the Department caused an uproar when it ordered public schools to condone all Grade 7 to 9 learners who had achieved 20% in Mathematics. However, the learners who obtain a pass rate of 20% in Mathematics in Grades 7 to 9 are not allowed to choose Mathematics as a subject in Grade 10. According to the DBE (DBE, 2016), a pass mark of 20% for Mathematics does not exist and there have been no alterations in the promotion policy of Mathematics. In 2018, Mathematics was no longer considered a subject compulsory for passing Grades 7 to 9. The Department indicated that Mathematics was dropped because not all learners are interested in Mathematics (DBE, 2016). Some learners are interested in arts while other learners are very good at technical subjects, which make this policy unfair to the learners who are compelled to choose Mathematics as a subject but perform poorly. Currently, the time frame of the Grades R-9 Phase is ten years. In order to proceed to Grade 10, a learner must comply with the following requirements:

a. A learner should comply with the requirements of the programme of Grades R to 9 exclusively, and
b. Fulfil all Grades R to 9 requirements of assessment as proposed in the National Protocol for Assessment of Grades R to 12 policy documents, as well as the

regulations in the Assessment Policy Statements of different subjects in the Foundation, Intermediate and Senior Phases (DBE, 2012).

In order to be promoted from grade to grade, each learner must take nine subjects in each grade and be able to meet the promotion requirements of eight subjects. In the Senior Phase, a learner may only be retained once. This rule is implemented in order to ascertain that a learner does not stay in the Senior Phase for more than four years. Each school designs an end-of-year assessment to assess the learners, teachers then mark the question papers and moderate the learners' performance. Seven levels of competence for various subjects are listed in the Grades R to 12 National Curriculum Statement (DBE, 2012). Table 2.2 below illustrates the different levels of achievement.

Table 2.2: Scale of achievement for the National Curriculum Statement Gr.7-9

Achievement Description	Achievement Level	%
Outstanding Achievement	7	80-100
Meritorious Achievement	6	70-79
Substantial Achievement	5	60-69
Adequate Achievement	4	50-59
Moderate Achievement	3	40-49
Elementary Achievement	2	30-39
Not Achieved	1	0-29

The aim of the above scale is to support the teachers in evaluating and ranking learners at the appropriate level. The results of the learners must be recorded in marks and reported as percentages. The percentage obtained by the learners will decide the rating code on the scale achievement (DBE, 2012). Each learner must choose his or her Grade 10 subjects based on the strength of his or her marks. The learner may also want to consider attending an FET college after Grade 9. If a learner struggles with Mathematics and he or she wants to continue with the subject into Grade 10 and beyond, he or she must consider a goal of at least 50%, otherwise Mathematical Literacy may become compulsory Learners are allowed to choose between Mathematics and Mathematics Literacy in Grade 10, which means that in Grades 7, 8 and 9, learners are forced to do Mathematics. The pass requirements for entry into Grade 10 are the following:

- A learner must obtain a minimum of 40% in Home Language
- A learner must obtain a minimum of 40% in two other subjects

- A learner must obtain a minimum of 30% in four other subjects
- A learner must pass at least 6 out of 7 subjects (DBE, 2012).

The above promotion requirements form the basis of this investigation as it seeks to explore whether the pass mark has an influence on the choice of Mathematics as a subject for Grade 10.

2.5 THE FACTORS WHICH CONTRIBUTE TO POOR PERFORMANCE OF LEARNERS IN MATHEMATICS

At the end of Grade 9, many learners do not choose Mathematics as a subject for the FET phase because of their poor performance which means that they were unable to reach the pass mark of 30% in Grade 9. According to (Köğce, *et al,* 2009), many factors contribute to the unsatisfactory performance of learners in Mathematics; for example, language of teaching, attitude of learners, conduct of learners, inspiration, parents' level of education and their financial situation and school-situated conditions such as accessibility and application of teaching and learning resources, classification of school and attributes of teachers, all of which are discussed in the subsequent sections.

2.5.1 Medium of Instruction

According to the Constitution of the Republic of South Africa (RSA, 1996), everyone has a right to receive education in the official language of his or her choice. The South African Government has declared all 11 languages of South Africa as official languages and is committed to promoting multilingualism and the advancement of previously marginalised languages through initiatives such as the National Language Policy Framework (DAC, 2002), National Curriculum System and the Pan South African Language Board (PanSALB). Although all the 11 official languages are recognised, most South African learners learn Mathematics and other subjects through the medium of English. The dominant medium of learning in education in South Africa is English, but it is the mother tongue of only 8.2% of the population (Lemmer & Van Wyk, 2010). English and Afrikaans-speaking learners complete their schooling (Grades 1-12) in their mother tongue, while learners who speak African languages are disadvantaged (Evans & Cleghorn, 2014). Research (Evans & Cleghorn, 2014; Lemmer & Van Wyk, 2010; McKay, 2012; Myburgh, Poggenpoel &

Van Rensburg, 2004) has indicated that most African learners, who learn Mathematics in English are challenged

According to (Myburgh *et al,* 2004), there is a good correlation between medium of instruction and scholastic achievement in Mathematics. In other words, where learners do not speak the language of learning, there is no effective teaching and learning in Mathematics. This implies that there will be poor academic performance of learners who are taught Mathematics in English. Teaching Mathematics in English to African learners, contributes to challenges in understanding the subject matter, questions as well as answering the questions (Myburgh *et al.,* 2004). This means that although learners use the English language to answer questions in exercises and assessments, many learners are at a disadvantage because they struggle to communicate in English. In a test or an examination, a learner may be unable to answer questions because of lack of understanding of the terms that are used in questions as well as being influenced by a negative attitude towards the language (Lemmer, Van Wyk & Berkhout, 2010). Research has shown that learners are able to learn effectively when taught in their mother tongue (McKay, 2012).

Wessels (2010) indicates that any type of learning takes place by means of language, which means that language is the key to academic performance of all learners. Therefore, in order to learn Mathematics effectively, all learners should have developed language fluency and competence so that they are able to participate in all learning activities effectively. However, African learners are challenged when English is used to learn Mathematics because this language is rarely or never used when they communicate in their homes, communities and at school in the classrooms and during breaks with their friends. In these situations, African learners use their mother tongue, which in the Limpopo are could be Xitsonga, Sepedi or isiZulu. African learners tend to use their mother tongue when they communicate and only use English language when communicating with other learners who speak different African languages. It is therefore apparent that African learners only use English in the classroom but because of lack of proficiency in English, many are not able to do their homework and participate in practical activities.

A further challenge experienced by African learners when learning Mathematics through the medium of English is that they do not understand Mathematics content. The major challenge of the African learners is that their competence levels in English are poor and they have not acquired the necessary vocabulary to use it in formal learning of any subject. Therefore, the use of English when learning Mathematics, contributes to the poor academic performance of learners. According to (Lemmer *et al.,* 2010), African learners who learn various subjects in the English language, perform very poorly because they do not possess sufficient knowledge of the English language which results in lack of self-confidence, emotional insecurity, poor self-image, anxiety and poor academic performance. According to (Mestrie, 2002), learning in a language that is not your mother tongue contributes to two major challenges, namely difficulty in using that language as the medium of instruction and difficulty in understanding the subject matter. According to (Webb, Lafon and Pare, 2010), learners who do not learn in their mother tongue, are not able to participate actively in classroom discussions, always fail, possess low self-esteem and feelings of inferiority and poor academic performance which more often than not, results in repetition of grades and even dropping out of school. The vehicle for education delivery should be the most appropriate in order to learn and achieve educational goals maximally. For English to be used as a medium of instruction of Mathematics, both teachers and learners need to be fluent and proficient. In South Africa, English becomes the language of learning and teaching (LoLT) from Grade 4, as per the language policy (DBE, 2010); however, in areas such as Limpopo which is predominantly populated by African-speaking people, acquiring and developing fluency and proficiency in English becomes a challenge for African learners.

2.5.2 Mathematical Anxiety

The concept ‘Mathematics anxiety’ is defined by (Nolting, 2010) as a condition of fear, incapacity, apathy and cognitive disarray that emerges in other learners when they are expected to resolve problems. Similarly, (Arem, 2010) describes the concept ‘Mathematical anxiety’ as a state of dissatisfaction that occurs in learners due to the challenges related to their tasks in Mathematics. Learners who feel stressed and are afraid to participate in various Mathematics tasks are regarded as possessing Mathematical anxiety (Beilock & Willingham, 2014). According to (Morada, 2015) and (Raju, 2018), there are three categories of Mathematical anxiety, namely abstraction

anxiety, numerical anxiety and mathematics test anxiety (Morada, 2015; Raju, 2018). Learners experience Mathematics test anxiety when they prepare for their mathematical tasks, when they are busy doing their mathematical tasks, after doing their mathematical tasks or an amalgamation of these (Raju, 2018). Abstraction anxiety emerges when the learners are busy doing notations of algebra and guidelines of Mathematics and doing tasks related to equations (Morada, 2015; Nolting, 2010). The findings of studies conducted by (Delgado, Espinoza and Fonseca, 2017), Erturan and (Jansen, 2015), (Ramirez, Hooper, Kersting, Ferguson and Yeager, 2018) and (Vakili and Pourrazavy, 2017), have revealed that mathematics anxiety results in a negative impact on the academic performance of the leaners. This finding indicates that learners who experience excessive mathematical anxiety achieve a very poor academic performance. This implies that teachers should be aware of and focus on the impact of mathematical anxiety on the academic performance of learners in Mathematics (Widiasih, Permanasari, Riandi & Damayanti, 2018).

2.5.3 School and Class Size

The size of the school and class also contributes to the academic performance of learners in Mathematics (Emmer & Stough, 2010). Studies (Emmer & Stough, 2010; Mtika, 2010 and Mweru, 2010) have revealed that overcrowded classes also contribute to poor learners' performance. According to (Motshekga, 2012), even though the maximum recommended learner-teacher ratio for South Africa primary schools is 40:1 and for secondary schools 35:1, overcrowding is found in many black schools especially in rural areas of South Africa (Motshekga, 2012). The major challenge is that if classes are overcrowded, there is usually a shortage of desks, shortage of textbooks and shortage of resources. Lack of space in classrooms contributes to overcrowding and unpleasantness thus obstructing academic activities. Large numbers of learners in overcrowded classes complicate class management and impede the reciprocity between the teacher and the learners. Mustafa, Mahmoud, Assaf, Al-Hamadi and Abdulhamid (2014) indicate that large numbers of learners in one classroom are an obstacle to general classroom management and classroom discipline in particular. According to (Marais, 2016), teaching in overcrowded classrooms generates a challenge in creating efficient and effective classroom environment of learning, where effective teaching and assessment methods are critical. Teachers are not able to implement various teaching methods, such as active

learning approaches and higher order questioning and teachers are as a result, limited to the ‘chalk and talk’ instructional method (Opoku-Asare, Agbenato & DeGraft-Johnson, 2014). In overcrowded classrooms, teachers are not able to pay attention to the whole class and are unable to divide their attention amongst the learners (Imtiaz, 2014).

Nicolson and Dymock (2012) report that the poor performance of learners in the Limpopo Province is caused by the shortage of textbooks and stationery. The Limpopo Education Department, on the 16 January 2019, acknowledged that there are schools in the province which still did not have textbooks and stationery (SABC News Online, 2019). According to (Mamokgere, 2019), the late delivery of textbooks and stationery to Limpopo schools seems to have been an annual occurrence ever since the 2012 textbook crisis. This challenge means that the shortage of textbooks and stationery contributes to the low academic performance of learners in Mathematics and other subjects in the Limpopo Province.

2.5.4 Attitude of Learners towards Mathematics

An attitude is defined as a predisposition or a tendency to respond positively or negatively to a certain idea, object, person or situation or an attitude problem (Mensah, Okyere & Kuranchie, 2013). Similarly, (Swanepoel, Erasmus and Schenk, 2008) describe the term ‘attitude’ as a level of positive or negative emotion a person possesses towards a certain object, such as other person, situation, thing or place. Attitude is also described as emotions, feelings (affective), experiences, past events (behavioural information) and attributes, thoughts, beliefs (cognitive) (Maio & Haddock, 2010). The normal perception is that when attitudes are aggressive or negative, challenges are produced which isolate and annoy other people. Learners who possess negative attitudes cause problems for the teachers, other learners and parents. It is argued that learner attitude has a bearing on mathematical achievement (Mahanta, 2014). According to (Effandi and Normah, 2009), learner attitude towards Mathematics is correlated to their attitude towards problem solving in general. Mahanta (2014) recommends that the practicality of Mathematics and how one feels when learning Mathematics (pleasure or disgust) and one’s self-esteem in mathematics will be functional in resolving mathematical challenges which eventually support the learning of Mathematics. Positive attitude towards Mathematics

contributes to learners' success while negative attitudes contribute to poor academic performance in Mathematics (Effandi & Normah, 2009). The attitudes are created gradually in the learning of any subject, and these attitudes result in a positive or negative impact on the academic performance and effectiveness of learners (Majeed, Darmawan, & Lynch, 2013). A study conducted by Mensah *et al.* (2013) revealed that the attitude of Mathematics teachers are related to learner attitudes towards learning Mathematics. When a teacher has shown a negative attitude, then learners will be influenced. Mata, Monteiro and Peixoto (2012) regard the support roles of teachers as one of the most powerful relationships in the development of positive attitudes towards the learning of Mathematics.

2.5.5 Peer Pressure

Peer pressure is usually observed as children develop and enter the adolescence stage. Their dependence on their family shifts to their peers especially in making choices and moulding their moral values (Uslu, 2013). During adolescence, teenagers usually want to conform with their peers and are ready to do what their peers do without knowing whether if it is good or bad for them (Moldes, Biton, Gonzaga & Moneva, 2019). Peer pressure often affects academic performance in a variety of ways and is one of the factors which results in the poor performance of learners in Mathematics (Moldes *et al.,* 2019). Peer pressure from the group may force the adolescent to do unnecessary things or display negative behaviour particularly with the presence of a strong or dominant peer group leader who forces a member of the peer group to engage in irregular or abnormal actions or encourage the group to become involved in unacceptable behaviour (Dumas, Ellis & Wolfe, 2012) which could have severe consequences on learner performance in subjects such as Mathematics.

2.5.6 Lack of Interest

Another factor which contributes to the low academic performance of the learners in Mathematics is lack of interest. A study conducted by (Jameel and Ali, 2016) revealed that there is a powerful correlation between interest and achievement in Mathematics. Jameel and Ali (2016) emphasise that poor performance in Mathematics at primary and secondary levels of schools is extremely disappointing for all and many learners at all levels regard Mathematics as an extremely challenging and monotonous subject which creates feelings of complexity, hesitation and inferiority. The learners who study

Mathematics tend to be afraid of this subject. Such a situation strongly hampers the process of their learning progress as they are afraid of mathematics and not motivated or interested in learning mathematics, which plays a crucial role in their performance in Mathematics (Jameel & Ali, 2016). The learning environment and the method of motivating learners according to their interests and aptitudes will automatically guide them towards their performance-based goal that will decrease the level of disappointment amongst all (Aunola, Leskinen & Leskinen, 2016). Lack of interest in Mathematics is caused by a large number of Mathematics teachers who are to blame for the negative attitudes and lack of interest of the learners in Mathematics. If teachers do not possess sufficient knowledge and skills to teach Mathematics dynamically and make the teaching of Mathematics practical and exciting, learners will not be motivated to become engaged in the subject (Sa'ad, Adamu & Sadiq, 2014). Developing and raising learners' levels of interest and involvement refers to how much time, energy and effort the learners allocate towards achieving high academic performance in Mathematics because learning process is quick and spontaneous (Aikins, Duel & Hutter, 2005).

2.5.7 Shortage of Resources

The shortage of resources is regarded as one of the major factors which contribute to the poor academic performance of learners in Mathematics. The resources used by learners include textbooks and computers, but human and financial resources are also needed as well as a sound infrastructure and time (Masalski & Elliot, 2005). According to (Masalski and Elliot, 2005), using laptops in a Mathematics class, is very important and can enhance the Mathematics classrooms when integrating them in the curriculum. Research conducted by (Ferrara, Pratt and Robutti, 2009) has revealed that new technology allows dynamical approaches to understanding the major concepts in algebra as well as in calculus when compared to the traditional paper and pencil practices and digital technology makes it simple to link multiple representations. This means that where possible, technology should be integrated in the teaching of Mathematics.

The physical environment of the classroom can affect the learners' attitudes and behaviour, which in turn can influence levels of achievement; for example, a classroom which has teaching aids such as manipulatives, wall charts, pictures, diagrams,

learner assignments displayed on the wall, will stimulate positive thinking about learning (GDE, 2008). The Mathematics textbook is also one of the most important resources for the teaching and learning of Mathematics in schools (Siyepu, 2013). However, (Siyepu, 2013) points out that there are complaints about the inappropriateness of textbooks in the field of Mathematics and Science in South Africa. Some textbooks have highlighted the issue of few learner activities while others have been criticised for having lower-order skills, such as recall, as opposed to higher order skills, like problem solving (Siyepu, 2013). A study conducted by Rezat (2009) revealed that a Mathematics textbook is one of the most important resources for teaching mathematics because learners use the mathematics textbooks not only in the classroom and for homework, but also of their own accord.

According to (VaradzaiMakondo& Makondo,2020) most mathematics teachers are unqualified or do not have the relevant skills to properly conduct mathematical operations. It was further highlighted that such lack of the relevant skills by the teachers is a direct cause of poor academic performance in mathematics for the following reasons; a teacher who does not have the relevant experience and skills in a complex subject such as mathematics will most probably struggle to optimize the resources available to him or her. Shortage of resources includes the shortage of textbooks, experience and skills that mathematics teachers do not have. Teacher's experience is significant and directly linked to a learner performance therefore if a teacher lacks the relevant skills, therefore a learner will in most likely lack the instructional skills required while shortage of resources is the main contribution of stagnation in learning activities and poor performance over the world. (Varadzai Makondo & Makondo, 2020).

2.5.8 Inadequate Parental Involvement

According to (Cotton and Wikelund, 2005), the involvement of parents in their children's learning is positively related to good academic performance. The most effective forms of parental involvement are those which engage parents in working directly with their children on learning activities in the home**.** This view is supported by Paul Colditz, CEO of the Federation of Governing Bodies of South African schools, who indicates that the starting point of a good quality education is parental support at home, not just assistance with homework, but also as role models who show

dedication (Davids, 2010). Colditz said that learners need parental involvement, especially when they come from backgrounds where their parents have not done matric and can only support them morally (Davids, 2010). Many parents in South Africa are however, not involved in the education of their children and this contributes to poor performance of learners (Davids, 2010).

To sum up, all these challenges described above collectively could contribute to poor performance of the learners in Mathematics.

2.6 HOW TO IMPROVE LEARNER PERFORMANCE IN MATHEMATICS

Many studies have been conducted about the enhancement of the academic performance of learners in Mathematics. Various researchers have recommended strategies such as professional development of Mathematics teachers, using a range of teaching methods and strategies, supporting learners in various ways and developing a positive attitude to the subject in an endeavour to enhance the academic performance of learners in Mathematics. Each of these aspects is discussed in the subsequent sections.

2.6.1 Professional Development of Mathematics Teachers

One of the best strategies of enhancing the academic performance of learners in Mathematics is to expand the competence of Mathematics teachers through continuous professional development. Professional development is a development strategy used since the early days of formal education and it has developed throughout time (Trehearn, 2010). Trehearn indicates that since the commencement of formal public education through the 1970s, teacher training was generally called ‘teacher education’ or ‘in-service’ by the public and since the 1980s, it has been called ‘staff development’. A push to regard teaching as a profession, gave birth to the concept ‘professional development’ in the 1990s, and finally, in 2006, Fullan, Hill and Crevola (in Trehearn, 2010) proposed the notion of ‘professional learning’ as a more appropriate concept.

Mizell (2010) describes professional development as a teaching strategy used by schools and school districts to guarantee that teachers continue to develop their instructional practices during their career. Formal Mathematics professional

development courses may be directed either towards the people who are inexperienced and seeking to gain entry into a particular profession or toward experienced professionals who seek some form of continuing education outside their usual place of work. The most effective professional development engages teams of teachers to focus on the needs of their learners (Mizell, 2010). The changes and enhancements that teachers experience during professional development motivates them to develop in their profession, better interact with learners and expand their knowledge, skills, attitudes and beliefs related to their teaching practices (Ching-Yun, 2008). Ching-Yun (2008) adds that the great change in teachers is the expanded broadness of ways of their thinking after training. Professional development also improves teachers' methods of questioning and communicating with their learners as well as enhancing their professional ability and performance and even their beliefs. They also learn by observing other teachers at work and from teaching presentations as well.

Support for teachers in South Africa mainly takes place during training workshops organised by the subject advisors and school management teams (SMTs) and developmental support groups (DSGs) constitute the internal sources of support for teachers in schools (Nkambule & Amsterdam, 2018). However, studies conducted by (Mahlo, 2011) and (Smith, 2011) revealed that teachers do not receive thorough, appropriate, and sufficient professional development in the schools. Van der Berg, Spaull, Wills, Gustafsson and (Kotzé, 2016) echoed this concern by stating that teacher professional development is far from adequate in most public education systems. It is therefore, vitally important that teachers be well prepared with both subject content knowledge (SCK) and pedagogical content knowledge (PCK) (Shulman, 1987) when they begin teaching and that they continue to develop and improve their knowledge and skills throughout their careers.

2.6.2 Using Various Teaching Methodologies

Teachers can improve the academic performance of their learners in Mathematics by using various teaching methods and not just using one teaching method. This opinion is supported by (Grouws and Cabulla, 2010), who assert that teachers should enhance their teaching effectiveness by changing their instructional practices, by first carefully considering the teaching context and then providing special consideration to the types

of learners they teach. In addition, when implementing new and varied methods, they should not judge the outcomes of their new practices too quickly. When implementing various teaching methods, the teacher should always inspect and adjust the way the method is implemented and received by the learners in order to optimise improvements in quality.

2.7.3 Support to the Learners

Learners' performance in Mathematics can also be improved by providing regular support to the learners. In order to provide extra instructional time to learners, one period in the learners' schedule should be reserved for an extra class in Mathematics (Bill & Melinda Gates Foundation, 2010). The extra classes which are also called 'shadow classes' or 'challenge classes' function effectively when they are closely coordinated with the curriculum and methods of the basic classes that they are supplementing.

Peer tutoring is also recommended for providing support to the learners in Mathematics. According to (Ali and Anwer, 2015), peer tutoring is an extensive strategy of learning which embraces a broad range of activities through which people learn through different techniques which range from a traditional model in schools to the more innovative learning groups in colleges and universities. Learners who learn in cooperative learning groups acquire more knowledge and they take their responsibilities in a better way as compared to others (Fernandez-Santander, 2008). Peer tutoring and cooperative learning provides the opportunity to the learners to interact directly with each other, it provides individual attention and enables the learners to reinforce and revise whatever they have studied before with them learning independently of the teacher (Ali & Anwer, 2015).

2.6.4 Teachers' Attitudes towards Learners in Mathematics

Another strong method of developing learners' ability and improving learners' performance in Mathematics is the attitude of teachers towards learners. According to (Bridget, Vemberg, Twemlow, Fonag and Dill, 2008), teachers' attitudes contribute to learners' academic performance in Mathematics and it is not only the confidence of teachers with regard to Mathematics and its helpfulness that are significant, but also the beliefs of teachers with regard to the competence of their learners to do

Mathematics. Positive attitudes create positive relationships between the teachers and the learners. (Mensah *et al,* 2016) emphasise that the confidence displayed by Mathematics teachers such as the significance of Mathematics, various methods of learning Mathematics, the complexity or simpleness of Mathematics as well as their belief in their learners' ability regardless of gender also affects their attitude towards the subject and has an impact on learners' performance. A positive teacher-learner relationship results in high academic performance of learners in Mathematics. Mathematics teachers are thus role models whose behaviour are easily copied by the learners.

2.7 CONCLUSION

This chapter provided an overview of the national and international literature on the benefits of learning Mathematics and its role in the future careers of learners. The role of the pass mark was discussed as it pertains to subjects in secondary schools. The influence of the pass mark on the choice of mathematics as a subject in Grade 10 revealed a range of aspects which could have an effect on a learner's choice particularly if it compromises a pass at the school-exit level. The literature review in this chapter included the theoretical background of Attrition Theory which focuses on how people explain happenings and how it is related to their perception and conduct. The next chapter, Chapter 3, focuses on the discussion of the research approach design and methodology which guides this study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Chapter 2 focused on the review of literature on mathematics as a subject, its significance and its value as well as the role that the pass mark plays in learners' choice of Mathematics for secondary schools in the FET Phase. In the previous chapter, the researcher reviewed different sources of literature for the purpose of studying and comprehending how scholars have conceptualised and theorised the academic performance of learners in Mathematics. The aim of this chapter is to present and discuss the research design and methodology that was used in this study. Chapter 3, with the research question of *How does the pass mark influence the choice of Mathematics as a subject by Grade 10 learners in Groot Letaba Circuit?* in mind, presents the research paradigm underpinning the research, as well as both the research design and approach. In addition, the research population and sampling method is presented with the data collection and data analysis methods being described and justified. The final sections of the chapter present the trustworthiness and credibility of the study and ethical considerations.

3.2 THE RESEARCH PARADIGM

The concept 'research paradigm' is defined as an indispensable gathering of beliefs shared by scientists, a category of agreements about how challenges are to be understood, how we perceive the universe and thus go about conducting research (Rahi, 2017). According to (Kumar, 2011:33), a paradigm refers to models of research, beliefs theories, methodologies, techniques, approaches and actions taken by the researcher when doing the study. To put it another way, a research paradigm is a category of principles about the universe and how it must be comprehended and researched. In other words, all studies must be situated within a particular paradigm that explains the research and researchers must acknowledge the communication of those opinions when conducting the study (Creswell & Piano Clark, 2018). There are three commonly used paradigms in research, namely positivist (objectivist),

constructivist (interpretive) and pragmatist paradigms. This study is situated in the constructivist paradigm.

Constructivism or interpretivism refers to the perception that reality is created by community-based factors and how the people understand the factors (Rahi, 2017). Constructivism is deemed most appropriate for this research as it will draw on people with their own various backgrounds, experiences and assumptions contributing their creation of reality to understand the phenomenon under study. To put it another way, constructivism is corresponded with subjectivity and that social reality may modify and may possess heterogeneous realities. The main purpose of conducting constructivist research is to establish a description by involving the world, instead of verifying measurable, objective and factual information. In this research, a description would be established during the research process by the creation of collaboration between the researcher and the participants.

3.3 RESEARCH APPROACH

According to (Creswell, 2014), quantitative and qualitative approaches are the two major categories of approaches that are applied by researchers in research. Due to the research paradigm and research design of this study, namely the constructivist paradigm and a phenomenological research design, a qualitative research approach was undertaken. (Creswell, 2014) describes the concept ‘qualitative approach’ as an inquiry or procedure used to comprehend a particular personal challenge which focuses on creating a complicated, integrated concept or image, created by terms or phrases, announcing complete opinions of participants and applied in a habitual context. The term ‘qualitative’ is also described by (Denzin and Lincoln, 2017) as an emphasis on the attributes of processes, institutions or organisations and on the clarifications that are not empirically evaluated or assessed according to constancy, number or strength. Denzin and Lincoln (2017) indicate that the researchers who apply a qualitative approach emphasise the socially designed character of the real world, the cordial relationships between the researcher and what is explored, and the circumstantial limitations that create the study. Qualitative researchers rely on miscellaneous truths or authenticity, are dedicated to comprehending the situations under investigation and are committed to the acknowledgment of viewpoints of the participants (Streubert-Speziale & Carpenter, 2003).

In this study, a qualitative approach was used because it permitted the researcher to conduct a study in a manner that reduced or eliminated disruption of the natural context of the phenomenon under study. Many people opt for a qualitative research approach because it permits them to supply descriptive data which is normally drafted, uttered or oral words of human beings (Brynard & Hanekom, 2005), as occurred in this study.

3.4 RESEARCH DESIGN

The concept 'research design' is described by (Pandey and Pandey,2015) as a scheme or structure of a research, that is utilised as a director in the collection and evaluation of information, while (Rahi, 2017) describes it as a category of normal process and directions that should be implemented when resolving a specific problem of the study. Research design is a plan that outlines the techniques and strategies applied in the study so that the research purpose and aim can be answered (Kumar, 2011). Consequently, the role of the research design is to provide support in the collection of appropriate data with the least use of finances, time and effort. In this research, a qualitative phenomenological research design was implemented by the researcher, to investigate how the pass mark influences the choice of Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit.

A phenomenological research design gives an explanation of all important matters experienced by the people (McMillan & Schumacher, 2010). When implementing this research design, the researcher was able to bracket or put alongside all assumptions and collect information on how people understand a particular phenomenon, situation or experience; in this case, the influence of the pass mark on the choice of Mathematics as a subject by Grade 10 learners. A phenomenological research design for chosen for this study because it was deemed capable of altering people's understanding about the influence of pass mark on the choice of Mathematics as a subject and it also allowed the researcher to reflect on and analyse the influence of the pass mark on the choice of Mathematics as a subject. In research, the research design of the study determines the research approach used.

3.5 RESEARCH METHODS

The concept 'research methodology' is described by (Rahi, 2017) as a group of strategies used by researchers in a specific sphere to arrive at a credible, logical and authentic understanding of circumstances, occurrences, procedures or affairs at numerous various phases. Research methodology includes aspects such as the population of the research, sampling, data collection and data analysis.

3.5.1 Population of the Study

According to (Rahi, 2017), a group of human beings, entities or occurrences with some similar characteristics that the researcher is wants to research is called a population. In this study, the population consisted of all Mathematics teachers and learners in secondary schools in the Groot Letaba Circuit of the Mopani District of Limpopo Province. This population consists of all the people who are directly involved in teaching and learning of Mathematics in the Circuit.

3.5.2 Sampling

According to (Pandey and Pandey, 2015), the term 'sampling' refers to choosing a number of subjects from a specified population as representatives of that population. A sample is a section of the entire population or a subdivision of evaluations taken from the population. (Schutte and Steyn, 2015) describe the term 'sampling' as identifying any section of a population as an agent of that population. Researchers conduct research of a particular sample in order to comprehend the whole population in which there is interest (Creswell, 2013). In this research, the researcher used purposive sampling to choose the sample to ensure that the aims and objectives of the study are realised (Schutte & Steyn, 2015) through the collection of rich data.

Four selected secondary schools in Groot Letaba Circuit of the Mopani District were sampled through purposive sampling. This strategy was adopted as it allowed the researcher to select the schools and the participants due to the researcher's judgement of the representatives that were considered to be most appropriate or agents in the study (Babbie, 2014). This means that purposive sampling was used to select four (4) Mathematics teachers and 20 learners from the four (4) selected secondary schools in the Groot Letaba Circuit. This sample was selected because it

consisted of all the people who are directly involved in teaching and learning of Mathematics at the FET Phase

3.5.3 Site Selection

Site selection is the process of applying qualitative techniques to determine the most favourable location for the study (Cohen, Manion & Morrison 2007). In this study, site selection also followed a purposive strategy in order to obtain rich data for the study. Four selected secondary schools in Groot Letaba circuit with low numbers of learners who select mathematics in Grade 10 were chosen as the site of the study. The four selected secondary schools were needed for relevancy and involvement in the study as they offered Mathematics at the FET Phase. The researcher requested permission from the relevant stakeholders (the Limpopo Department of Education and the principals of each of the schools) to gain access to the site to conduct the research.

3.5.4 Participant Selection

Purposive sampling was used to select the participants as it allowed the researcher to select participant at each of the sites that would be most useful and ensure that the aims and objectives of the study were realised (Babbie, 2014). Four Grade 10 Mathematics teachers who teach at the four selected secondary schools were purposively chosen based on teaching mathematics in Grade 10 and having at least five years and above experience. Twenty Grade 10 learners who obtained marks between 0-30% in the Grade 9 end-of-year Mathematics assessment were selected as participants as even with the low pass mark, they selected the subject for the FET Phase.

3.5.5 Pilot Study

The role of a pilot study is to create the credibility of the research device, enhance questions and structure, assess the processes and collect information before the major research is conducted in order enhance the quality of the study (Creswell, 2013). All the procedures of the pilot study are the same as the processes of the major research but the pilot is a small-scale survey. Five secondary school teachers from one school in the Groot Letaba Circuit participated in the pilot study. As a conclusion of the pilot study, the five teachers were asked to comment on the research questions. The researcher examined any signal that the participants were disturbed or had

experienced any problems when responding to the interview questions. The researcher in consultation with the supervisor, evaluated the interview questions and then formulated the final interview schedule.

3.5.6 Data Collection

Data collection is described by (Creswell, 2014) as the precise, systematic gathering of data which is relevant to the research sub-questions, by means of methods such as focus group discussions, interviews, participant observation, case histories and narratives. In this study, semi structured interviews were conducted to collect data from teachers and focus group interviews with learners.

3.5.6.1 Individual face-to-face interviews

According to (Van Rensburg, Basson and Carrim, 2011) and (Brynard and Hanekom, 2005) an interview is a strategy of gathering information that permits researcher to interrogate the participants common, unrestricted and/ or closed questions and record the answers. An interview is favoured in this research because it will be capable of providing extra and more extensive data as well as permitting the researcher to create association with the responders. There are generally two main types of interviews, namely structured and unstructured interviews. In structured interviews, the questions, order, wording and their sequence are fixed and identical for every respondent, while in an unstructured interview, the interviewer does not follow a rigid structure, but covers as much ground on a given topic with the participant (Brynard & Hanekom, 2005).

Creswell (2014) describes a semi-structured interview as a method of gathering information permitting open-ended questions that provide opportunities for more details and deeper understanding of the information. In this study, the researcher preferred to use semi-structured interview because although each interview was guided by an interview schedule, it allowed searching for more data and create a close association with the participants of the research in order to acquire extensive data. Using a semi-structured interview method in this research allowed the researcher to collect more information and to probe when necessary (Newton, 2010).

The semi-structured interview aimed at collecting data of the experiences, comprehensions and emotions of the participants, about how the pass mark influences

the choices of learners in taking Mathematics as a subject in the FET Phase. During the interviews, guided by the interview schedule (see Appendix J), the researcher introduced the topic to the respondents and then endeavoured to establish rapport with the interviewees. The researcher asked each participant a question and then listened to the participant response giving the participant the latitude and the time to speak freely but guiding the discussion to ensure that all questions and aspects were covered. The researcher was flexible and allowed slight deviations from the topic but probed where necessary. With permission from the participants, the researcher tape-recorded the interview for verbatim transcription later. By recording the interviews, the researcher was able to focus on the conversation and to probe where necessary. To sum up, in interviewing the four teachers from four selected secondary schools, questions were asked, discussion entered into with responses being recorded and documented.

3.5.6.2 Focus group interviews

Focus group interviews can be described as the type of interview where participants are purposively selected to share their knowledge, ideas, feelings and attitudes through a guided discussion with the aim of developing greater understanding of the phenomenon under study (Creswell, 2014). A focus group comprises a group of five to 12 homogeneous participants who are interviewed by a researcher (McMillan & Schumacher, 2010).

In this study, the focus group interview was used to interview 20 Grade 10 learners from the four selected secondary schools with five learners in each group. The researcher scheduled to meet each group on an agreed-upon date. The researcher, guided by the interview schedule (see Appendix K), asked each focus group the questions and the members of the focus group entered into a discussion, cooperating with each other and affecting each other during the argumentation where they were able to reflect on views and perceptions. The aim of the focus group is to reach an agreement, come to some level of consensus or determine what to do about something (McMillan & Schumacher, 2010). After reaching consensus on the discussion, the leader of the group provided an answer for the whole group. The researcher used a tape recorder to record the answers. The focus group interview was preferred in this study because it allowed the researcher to get input from learners

studying Mathematics at Grade 10 level, with their diverse backgrounds and perspectives.

3.5.7 Data Collection Procedure

The researcher began the process by requesting permission from the various stakeholders such as the Head of Department, Limpopo Province Department of Basic Education, the circuit manager, the school principal, the teacher participants and the learner participants' parents. Once the dates and times for conducting the interviews were scheduled, data collection could proceed. Both individual interviews with teachers and the learner focus group interviews took place after school hours in order not to disturb the smooth running of the school. Follow-up interviews were scheduled to place preferably ten working days after the initial interview if clarity on issues was needed.

3.6 DATA ANALYSIS

In all research, the information gathered requires analysis before interpretation. According to (Pandey and Pandey, 2014), analysis of data is a procedure of inspecting and interpreting information in order to acquire meaning, procure comprehension and create empirical knowledge. Data analysis took place simultaneously with data collection to ensure that follow ups were done on important issues emerging during the interviews. The aim of analysing data is to report the information distinctly, distinguish what is similar and different, expose the differences, associations and other regular designs found in the information and finally respond to the research questions (McMillan & Schumacher, 2010). The Thematic Data Analysis Method was used to analyse the qualitative data collected through semi-structured interviews and focus group interviews. Creswell (2014) describes the Thematic method as one that breaks down the whole and organises it into smaller units, identifying similarities and differences, connections, relationships until a greater comprehension of what is implied is realised. The analysis of qualitative data requires the process of coding (Creswell, 2014:33) conducted by means of preparing, organising, examining and perusing all transcripts cautiously and making notes in the margins. A system of categorising is the method used to separate information into various sections (McMillan & Schumacher, 2010).

Each topic is assigned to an abbreviated and identifiable code which is written near the sections of information that coincide with the code. The topics are then turned into categories or themes. The information or data of each theme or category is gathered in one place. The themes that emerged were used to answer the research questions and are reported on in Chapter 4.

3.7 TRUSTWORTHINESS AND CREDIBILITY OF THE STUDY

Trustworthiness of the research means the extent of correspondence between the descriptions of the occurrences and the actuality of the universe (McMillan & Schumacher, 2010). Creswell (2014) asserts that to regulate the preciseness of the research data, debate the universality of the research and suggest the probability of duplicating a research, are considered as the methodical proof of a scholarly study. The researcher ensures these procedures by creating the trustworthiness of the research. McMillan and Schumacher (2010) define the term 'credibility' as the level of similarity between the actuality of the universe and the description of the phenomenon. The standards of credibility are aimed at ensuring that the results of qualitative research are reliable or acceptable from the perception of the participant in the research procedure. Researchers use different criteria to ensure the trustiworthiness and credibility of a research. In this research, the researcher implemented the following strategies to guarantee the trustworthiness and credibility of qualitative information.

3.7.1 Making Use of a Diversified Sample

In this research, the researcher guaranteed the trustworthiness and credibility of the research by implementing a diversified sample. A diversified sample is a sample which is not consistent in constitution or make-up (Creswell, 2014). In this study, the diversified sample consisted of masculine and feminine and junior and elderly participants in order to ensure reliability and trustworthiness. The sample included two female and two male teachers. One teacher fell in the 30 to 40-year age range, two teachers in the 40 to 50-year range and the last teacher in the 50 to 60-year age range. This sample also included one teacher with 5-10 years' teaching experience, two teachers with 10-20 years' teaching experience, one teacher with 20-30 years'

teaching experience. The learner sample also included 20 learners, comprising 10 female and 10 male Grade 10 learners.

3.7.2 Devoting Time in the Research Area

Devoting much time in the research area means to communicate with the participants over a period of time until sufficient data is collected (McMillan & Schumacher, 2010). In this way, the researcher was able to acquire profound comprehension of the circumstance under study and particular characteristics of participants such as their knowledge, skills, perceptions and views. Devoting time in the research area also produced affinity, interrelationships and confidence between the researcher and participants which is key to the collection of extensive information (McMillan & Schumacher, 2010). In this research, the researcher collected data in the research area until data were saturated or deemed enough information to ensure answering the research questions. Devoting time in the research area, supported the researcher in creating a strong association of confidence with the participants.

3.7.3 Mechanical Recording of Data

The researcher ensured the credibility of the study by recording the interviews. The researcher used a tape recorder to provide genuine and complete records of the data collected by means of interviews (McMillan & Schumacher, 2010).

3.7.4 Use of Thick Description

The use of thick description involves a deep sense of and detailed accounts of the phenomenon of inquiry with a particular consideration of the contexts in which it occurs (McMillan & Schumacher, 2010). Thick description involves complete and rich explanations of participants' experiences of the phenomenon as well the context in which these experiences occur. In this research, the researcher ensured the trustworthiness and credibility of this research, by applying a broad explanation of the circumstances under investigation, which is significant in ensuring transferability because it assisted the researcher in communicating the actual situations that were investigated as well as the contexts that surrounded the participants.

3.7.5 Participant Review (Member Checks)

The evaluation, checking or assessment by the participants of the study means the confirmation of the collected data by relaxed and friendly discussions in unofficial contexts (McMillan & Schumacher, 2010). Schutte and Steyn (2015) regard the checking of the credibility of collected data by the participants of the study as a significant process which is able to bolster the credibility of the study. In this research, checking of the credibility of collected data by the participants of the study was applied 'on the spot' during the interviews and after collecting the data. The participants were requested by the researcher to peruse all the interview transcripts of their interviews and requested them to check whether the transcribed data matched the information that they really wanted to transmit. The participants were allowed to change or amend their statements.

3.7.6 Promotion of Honesty

In this research, the researcher promoted honesty during the process. For the purpose of promoting the honesty of this study, all the participants of this study were given the option of accepting or refusing the request to participate in the study. This process ensured that the provision of data would only involve the people who were genuinely interested in participating in the study and who were ready to share information voluntarily.

3.7.7 Transferability

Guba and Lincoln (2005) describe transferability as the degree to which the findings of qualitative research can be popularised or conveyed to other situations or environments (Guba & Lincoln, 2005). In a study based on a qualitative approach, transferability is the main accountability of the human being who is conducting the generalising (Guba & Lincoln, 2005). In this research, the researcher enhanced transferability of the research by executing a rigorous duty of explaining the research setting and the presuppositions that are the key to this study. After the reporting of the findings of this research, any person who wishes to transfer the findings to another setting is accountable for creating a judgement of how reasonable the transfer is.

3.7.8 Dependability

In this study, the researcher also ensured the quality of this study by guaranteeing that there is successful dependability in the research. The role of dependability is to ensure that the research findings are constantly matched and may be duplicated and this is evaluated by the principle on which this study is explored (Guba & Lincoln, 2005). The dependability of this research was ensured by using successful and honest strategies of collecting data, analysing data and delivering of the findings.

3.7.9 Confirmability

Guba and Lincoln (2005) define the term 'confirmability' as the extent to which the research outcomes or consequences may be authenticated or endorsed by other people (Guba & Lincoln, 2005). Confirmability is grounded on the acknowledgement that there is no study which is unprejudiced. Another purpose of confirmability is to address the truth that research results should portray as far as is ethically feasible, the condition being researched instead of the confidence, theories or prejudices of the researcher (Guba & Lincoln, 2005). The confirmability process may be enhanced by various strategies. The researcher implemented different processes for scrutinising and re-scrutinising the information during the study. As a conclusion of the research, the researcher conducted data analysis that evaluated the gathering of information, reviewed processes and presented judgements about the possibility for prejudice or defamation.

3.8 ETHICAL CONSIDERATIONS

The term 'ethics' or 'ethical' means the moral guidelines and standards that every researcher uses for assessing his or her behaviour during the research procedure (Babbie, 2014). In this study, the researcher complied with the following most important ethical standards of research described by (Babbie, 2014), Creswell (2014) and (McMillan and Schumacher, 2010) by obtaining permission to conduct the study, voluntary participation, informed consent, ensuring minimum risk to participants as well as anonymity and confidentiality.

3.8.1 Obtaining Permission to Conduct the Study

After the approval of the research proposal, the researcher obtained ethical clearance from the Research Ethics Committee of the University of South Africa (Ref:

2019/11/13/45825122/51/AM see Appendix A). The researcher then requested permission from the Head of Department, Limpopo Province Department of Basic Education to request permission to conduct the study in the Groot Letaba Circuit (see Appendix B). Thereafter, the researcher wrote to the principals of the selected schools to outline the purpose and procedures of the study and to request permission to conduct the study in the selected schools (see Appendix D).

3.8.2 Voluntary Participation

The ethical standards of research are also guaranteed by ensuring that there is voluntary participation in the study (Babbie, 2014). In this study, all the participants were invited to participate in the study and were given enough time to decide whether they would participate in the study or not (see Appendices E-I). The researcher also informed the participants that they were free to terminate their participation at any time without any consequences.

3.8.3 Informed Consent

In all studies, researchers should guarantee that there is a declaration of agreement of all the participants of the study. In order to ensure informed consent of all the participants of the study, the researcher informed the selected participants of the entire study and supplied them with the details of the research including the aim and significance of the research and the benefits of participating in the research (Vanclay et al., 2012).

3.8.4 Plagiarism

The term plagiarism means not giving credit to an original source of an idea or writing (MacMillan & Schumacher, 2010). This definition indicates that plagiarism means not using own words and not lifting chunks of information from the sources. In order to avoid plagiarism, all materials used in the study are duly acknowledged.

3.8.5 Minimisation of Risk to Participants

Lastly, any potential risk to participants was minimised by assuring the participants that their participation in this research would not cause them any physical discomfort, humiliation and emotional stress. This was achieved by an initial meeting with all the

participants to gives details of the study. The researcher also assured participants that the study would not interrupt their normal teaching lessons as data collection would be done after working hours (Draucker et al., 2009).

3.8.6 Respecting Privacy (Confidentiality)

In this research, the confidentiality of the participants was guaranteed by not disclosing the names of all the participants to outsiders, where it might have had embarrassing or damaging consequences (Creswell, 2014). Furthermore, the researcher ensured that all the information collected during the interviews were stored in a place of security. All the hard data is being stored in a locked cabinet and the data will be destroyed after completion of the study. All electronic data was stored in a computer requiring password access.

3.9 SUMMARY

In this chapter (Chapter 3), a comprehensive explanation and interpretation of the research design and methodology used in this study was presented. This chapter encompassed the research paradigm, design, approach, population, sampling, piloting, data collection, data analysis, trustworthiness and credibility, limitations and ethical considerations of this study. The next chapter (Chapter 4) focuses on the presentation, analysis and interpretation of the results of this study**.**

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

The primary goal of this study was to explore how the pass mark influences the choice of learners in Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit. The previous chapter focused on the research methodology which guided the study. The purpose of this chapter is to analyse and interpret the data and present the findings and collected from four Mathematics teachers and 20 Grade 10 learners from four schools in the Groot Letaba Circuit. Data was collected through individual interviews and focus groups interviews being guided by the main research question: *How does the pass mark influence the choice of learners in Mathematics as a subject in Grade 10 learners in Groot Letaba Circuit?* In this chapter, the participants' views about the influence of the pass mark on the choice of Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit is presented in verbatim form.

4.2 ANALYSIS OF DATA COLLECTED FROM TEACHER INTERVIEWS

In this section, the data collected by means of individual interviews are analysed and interpreted and findings are presented. The teachers who participated in the study are referred to as participants 1, 2, 3 and 4. This is in compliance with the ethical considerations that the names of all the participants as well as their places of work will not be revealed in the study. The responses of the interview questions were categorised into the following four main themes and sub-themes. The themes are discussed in detail in the next section.

Table 4.1: Themes and sub-themes emerging from the teacher data

Main Themes	Sub-themes
1. The benefits of Mathematics	Developing the economy of South Africa Knowledge development Creating employment opportunities Improving their lives.
2. The role of the pass mark	Perceptions of the Mathematics pass mark

Main Themes	Sub-themes
	Gauge achievement Motivation
3. The influence of the pass mark on the choice of Mathematics as a subject in secondary schools	Fear Lack of motivation Laziness Failing of Mathematics in Grade 9.
4. How learners can be motivated to choose Mathematics in Grade 10	Using a variety of methods when teaching Mathematics Teaching extra hours. Resources. Professional development of teachers.

4.2.1 Main Theme 1: The Benefits of Mathematics

This main theme emerged from the analysis of data produced by third research question. The participants were asked about the benefits of learning Mathematics. The study revealed that there are four main benefits of learning Mathematics, namely, Mathematics develops the economy of South Africa, it develops knowledge, creates employment opportunities and improves the lives of learners and other people.

- **Sub-theme 1: Mathematics develops the economy of South Africa**

The findings of the study indicate that all the participants acknowledge that Mathematics grows the economy of South Africa. Participant 1 indicated that Mathematics improves the lives of the people by equipping them with knowledge and skills which would offer them the opportunity for a good career. The following quote is a response of Participant 1 about the value of Mathematics:

Participant 1: *Mathematics contributes to better life of the people because it enables people to get good jobs with high salaries. This improves the economy of South Africa and as a country more engineers, doctors, scientist, economist, accountants, businesses are produced. Our economy will grow and more jobs will be created.*

The above quote indicates that Mathematics is the subject that ensures that people of South Africa are employed in vital important professions with good salaries. With such educated and skilled people, it helps to grow the economy of the country. Participant 2 suggests that Mathematics is the core of existence because everything is based on

Mathematics and provides learners with a wide choice of careers. The following is what Participants 2 and 3 said:

Participant 2: *Everything in life, especially today needs Mathematics. South Africa is all about Mathematics or numbers for example like the distance. It gives learners more choice in career opportunities and high wages. It makes your life easier after Matric/Grade 12, because you will go and be able to do everything you want in any universities/colleges of your choice*.

Participant 3: *Mathematics enables the business sector to grow to competitive levels. Mathematics grows our economy because we will be innovative. There are so many benefits of Mathematics in the economy of South Africa.*

Participant 4 also supported the benefits of learning Mathematics by indicating that learners equipped with Mathematics knowledge and skill, have the ability to improve the economy of South Africa. Participant 4 responded as follows:

Participant 4: *Mathematics enables the people of South Africa to get more opportunities in careers. Many careers in South Africa are able to improve the economy of the country.*

The participant responses revealed that Mathematics should be considered a major subject crucial in developing the economy of South Africa. Mathematics is relevant in all walks of lives, applied in all careers, improving the lives of the people of South Africa and providing them with significant well-paid employment.

- **Sub-theme 2: Knowledge development**

The participants' responses revealed that Mathematics, used in everyday life and applied in every career path, has the ability to develop vital qualities such as reasoning, creativity, critical thinking and problem-solving. Mathematics enhances knowledge and motivates people to become creative, which improves their lives. This perception is supported by Participant 1 who emphasised that people who study Mathematics are able to develop critical thinking skills which allows them to analyse, assess, interpret, infer and problem solve.

Participant 1: *Mathematics develops their analytical thinking, reasoning, recording information and interpretation of information. The people with these capabilities are very successful in life.*

Participant 2 also supported the view that Mathematics stimulates creativity and added that Mathematics has also improved the lives of teachers because during the course of their training and teaching they have been able to acquire and develop Mathematical knowledge and skills.

Participant 2: *Mathematics is very important in the lives of the people because it motivates people to think deeply and favourably in their lives. I also believe that Mathematics also improves the critical thinking of Mathematics teachers because Mathematics teachers are able to gain more knowledge than those who are not teaching Mathematics.*

Participants 3 also supported the stimulation of creativity by Mathematics. Participant 3 emphasised that Mathematics develops knowledge and skills of the learners, which improves their lives.

Participant 3: *When all our learners study Mathematics, they will be able to think critically. We shall never [need to] import experts from other countries because we shall have our own experts who have relevant knowledge and skills that are required in improving the lives of our people. I like Mathematics because it enables the people to acquire more knowledge and skills. When all our learners study Mathematics we won't lack any knowledge and skill in our country.*

Participant 4 also emphasised the development of more knowledge and skills as the major benefits of learning Mathematics.

Participant 4: *Mathematics helps learners to develop their knowledge and to be flexible in the use of their skills. The learners who studied Mathematics will be able to solve their problems and also learn new skills.*

According to Participant 4, learning Mathematics develops knowledge which promotes flexibility in solving challenges, exercising the brain and stimulating creativity. Mathematics offers learners many opportunities when it comes to skills development and jobs.

All participants of this study emphasised that Mathematics develops the knowledge of the learners and enables them to become more creative in society. The participants

indicate that the people who studied Mathematics are able to think deeply, develop new ideas and are able to improve their lives and society at large.

- **Sub-theme 3: Creating employment (careers) opportunities**

Participants 1, 3 and 4's responses also indicate that learning Mathematics is very important to the learners and economy of South Africa because it enables them to take up a range of important careers, not just as mathematicians and scientists, but a wide range of careers from dressmaker to baker to teacher, all of which need some knowledge and skill of Mathematics. In her own words, Participant 1 responded as follows:

Participant 1: *Learning Mathematics is very important for our learners and other people of this country. The learners who studied Mathematics are able to occupy various careers such as engineers, pharmacists, medical doctors, electricians and agriculturists. The learners are not forced to focus on one career only but are free to choose any important career that they wish to occupy.*

Participant 3 also supported that notion that Mathematics enables access to various important careers to ensure that South Africa is able to draw on its educated and well-skilled people for its workforce. Participants 3 and 4 responded as follows:

Participant 3: *Mathematics ensures that we have our own people in every sector of careers rather hiring people from outside. The learners who studied Mathematics may become engineers and scientists and all careers will be occupied by the people of South Africa. Mathematics ensures that the business sector avoids the employment of foreigners in South Africa, which reduces unemployment in South Africa.*

Participant 4: *Mathematics is very important in the whole world because it gives learners more careers. Mathematics enables the people of South Africa to get more opportunities in careers. Many careers in South Africa are able to improve the economy of the country.*

The responses of Participants 1 and 4 revealed that learning Mathematics is very important because it allows learners who studied Mathematics to take up various important careers in South Africa. The learners who have studied Mathematics can become various types of engineers and scientists; however, as Mathematics is vital in many careers, it is essential for learners to study the subject.

- **Sub-theme 4: Improves the lives of learners and other people**

The participants' responses also revealed that Mathematics is a very important subject essential in improving the lives of the learners. Participant 1 confirmed this perception by responding as follows:

Participant 1: *Mathematics is very crucial to the lives of all the learners who studied Mathematics. All the learners who studied Mathematics are able to improve their lives and are able to improve the lives of other people. I strongly support this subject because it makes lives easier.*

The perception of Mathematics providing the learners with the ability to improve their lives by not only offering access to many careers but in everyday life. This was also supported by Participants 2 and 3 who responded as follows:

Participant 2: *I strongly believe that Mathematics is not like other subjects. It is the best subject in the world because it is able to improve the lives of the learners who studied Mathematics and the lives of other people. I am motivating all the learners to choose Mathematics so that they can be able to improve their lives.*

Participant 3: *There is only one subject which is able to improve the lives of the learners and that is Mathematics. In my life I have realised that the people whose lives are better than others are those who studied Mathematics. I therefore believe that Mathematics has a major role to play in the world.*

All the participants of the study believe that Mathematics is very important for the learners and all the people of South Africa. The participants indicate that Mathematics develops the economy of South Africa, develops knowledge and skills of people, creating employment or careers opportunities. In addition, Mathematics is necessary in everyday life with working with money and managing finances, time management, working with quantities in careers such as baking, cooking, dress making to name a few, being able to problem-solve and reach solutions. The development of Mathematical knowledge and skills has the ability to improve the lives.

4.2.2 Main Theme 2: The Role of the Pass Mark

This main theme emerged from the responses of the second research question. The participants were asked about the role of pass mark in the schools with the study revealing their perceptions on the pass mark, and the role it plays on making subject choices.

- **Sub-theme 1: Perception on the Mathematics pass mark**

The findings revealed that the participants are not happy with the current Mathematics pass mark which has been set at 40%. Participants 1, 2 and 4 want the pass mark to be increased and remain stable, meaning that it should not keep on being amended.

Participant 1: *The pass mark is not satisfactory. The rating is categorised according to learning area per phase. I suggest that the pass marks for all learning areas should be 50% so that they can do any career they want and succeed in universities. They should not change the pass mark through Gazetting and do pass mark relaxation. The pass mark must remain stable always. If the majority of our learners get 30% or less, they will experience problems in future.*

Participant 1 was supported by Participant 2 who felt that such a low pass mark did not motivate the learners to set high goals for themselves which thus limits their future career paths.

Participants 2: *I am not satisfied of the current pass mark because the learners are lazy to study because they know that they are going to work for a lower pass mark. Such pass rate stands the possibility of being further decreased by the Gazette at the end of the year and this situation limits opportunities for learners to get admission to tertiary level because of the high standards of higher education institutions. Starting from Foundation Phase, all subjects must be set at 50% as pass mark.*

Participant 4 also supported the idea of increasing the current pass rate to ensure a 50% pass mark across all phases of basic education:

Participant 4: *I am not satisfied about the current pass mark because it is very low. Learners become lazier because of current pass rate and if it is higher pass rate they may be encouraged to work harder. The government must increase the pass rate as soon as possible in order to motivate learners to work very hard.*

Participant 3 offered a different opinion and is satisfied with the current pass mark of 40%, stating that this pass mark offers more learners a chance of passing.

Participant 3: *I am absolutely satisfied with the current pass mark because it will enable learners to pass accordingly. Learners are still motivated to work hard work because if the pass mark is lower, they stand good chances of passing if they are currently struggling with the pass mark that is being used even though it is said to be low.*

The responses of Participants 1, 2 and 4 revealed that teachers believe that the current Mathematics pass mark of 40% is very low and it should be increased. They want the pass mark to be increased because they believe that a higher pass mark of 50% will motivate the learners to work very hard in Mathematics to ensure that they pass Mathematics. The participants also believe that the current pass mark of 40% is very low and learners are not motivated to aim higher. The findings also revealed that Participant 3 supports the current 40% pass mark for Mathematics because more learners would then able to pass but if the pass mark can be increased, many learners will not reach 50%, fail Mathematics and thus become demotivated.

- **Sub-theme 2: Gauge achievement**

All the participants indicated that the function of pass mark is to gauge or evaluate the achievement of the learners. According to Participant 1, the function of the pass mark is to indicate whether the learners has passed or failed Mathematics – it is a benchmark indicating the minimum mark necessary to proceed to the next grade.

Participant 1: *It is the minimum mark required in the examination that guides the school and the Department of Education to see the number of learners achieved and those who did not achieve. It is also a benchmark that allows learners to pass subjects. It differs per subject. According to Policy progression requirements, Grades 7 to 9, Mathematics minimum pass mark is 40%.*

Participant 2: *The pass mark is the minimum mark needed in the examination, which indicates if a learner has passed or failed Mathematics. Without a pass mark, it will not be possible to see whether the learner should proceed to the next grade or not.*

Participant 3 also supported the idea that the function of pass mark is to gauge or evaluate the performance of the learners. Participant 3 revealed that the pass mark is an instrument which is used to indicate whether a learner has passed any subject, including Mathematics, in that grade.

Participant 3: *The pass mark is very important in schools because it is guiding tool which is used to determine the mark needed for achieving the subject. The same thing applies to Mathematics. It is used in Mathematics to show the mark which must be achieved by the learners in order to pass a particular grade.*

The findings also revealed that Participant 4 indicates that the role of pass mark is to evaluate if a learner has developed sufficient understanding and skill in Mathematics at his or her grade which indicates that the learner is ready to be promoted to the next grade.

Participant 4: *The role of pass mark in Mathematics and also in all the subjects is to see if learners understand the subject in that grade so that he can proceed to the next grade. A learner who does not understand Mathematics of a particular grade must be forced to repeat that grade.*

The above participants of this study believe that pass mark is a very important aspect in educational institutions because it is used to evaluate the achievement of learners. The pass mark is used by teachers to evaluate the academic performance of the learners in daily academic activities. Teachers require a pass mark to see whether a learner has acquired sufficient knowledge and skills in a particular subject. The Department of Basic Education, who is responsible for the promotion of the learners, need to set a pass mark as a benchmark, in order to promote a learner if they have acquired sufficient knowledge and skills, to the next grade. The pass mark is therefore the basis of determining the academic performance and achievement of the learners in all subjects.

- **Sub-theme 3: Motivation**

Participants 2 and 3 indicated that the role of pass mark is a benchmark which motivates the learners to work hard in Mathematics and attain a certain standard in

order to proceed to the next grade. Participants supported the notion that the pass mark motivates the learners to set their own goals. Participants 2 and 3 responded as follows:

Participant 2: *Pass mark make learners work hard at school. It helps the learners to work hard in order to obtain the pass mark.*

Participant 3: *Pass mark is very important in Mathematics and other subjects because it enable the learners to set a target for improvement. Setting the target will make the learners to work hard in Mathematics.*

According to the participants, the pass mark is significant as a benchmark for the learners because it motivates the learners to work very hard. The learners use the pass mark as a target for improving their academic performance. According to the participants, without a pass mark, learners will not have a yardstick against which to measure improvement in their academic performance.

4.2.3 Main Theme 3: The Influence of the Pass Mark on the Choice of Mathematics as a Subject in Secondary Schools

The participants were asked about the influence of the pass mark on the choice of Mathematics as a subject in secondary schools. The study revealed that fear, lack of motivation and laziness are factors that seems to have an influence on learners, on their choice of Mathematics as a subject.

- **Sub-theme 1: Fear**

The study revealed that most learners are intimidated by Mathematics as a subject in Grade 10 for the FET Phase. This finding was confirmed by all participants, who indicated that learners do not choose Mathematics as a subject because they are fearful of what Mathematics entails. For example, Participant 1 indicated that because learners always failed mathematics, they were nervous of choosing Mathematics as a subject in Grade 10.

Participant 1: *Many learners are scared to choose mathematics because they scored low marks in Grade 9. Learners are scared of doing mathematics and even those who scored above 40%, they fear that in Grade 12, they won't pass mathematics. As a result, they would fail Grade12.*

Participant 2 also supported the idea that learners are scared of choosing mathematics and indicated that learners do not choose mathematics as a subject because other learners tell them that Mathematics is a difficult subject, which causes them to be afraid of Mathematics.

Participant 2: *Learners do not like Mathematics as a subject in Grade 10 because they are scared to choose Mathematics by hearing other learners that mathematics is difficult.*

The perception of fearing to choose mathematics as a subject was also supported by Participant 3 who also emphasised that the continuous failing of mathematics in Grade 9 instilled fear in choosing Mathematics in Grade 10.

Participant 3: *I am very confident that our learners do not like to choose Mathematics as a subject in Grade 10 because they were always getting low marks in Grade 9. Due to continuous getting low marks, they therefore fear failing Mathematics in the next grades.*

Participant 4 also supported the notion of learners being fearful of choosing Mathematics as a subject indicating that learners do not choose Mathematics as a subject because of feelings of inadequacy particularly if there has been failure in the subject in previous grades which results in learners being afraid of the complexity of the subject. This implies that the learners believe that Mathematics was designed for very intelligent learners or learners who are particularly clever and this then excludes many of them, particularly if they have not reached the benchmark of 40% in Grade 9.

Participant 4: *I am quite certain that learners fear to choose mathematics as a subject in grade 10 because of inferiority complex. The learners believe that mathematics was designed for geniuses and they developed inferiority complex, where they believe that they are not geniuses. I have realised that some learners can do better but they are scared of mathematics.*

All four participants emphasised that learners do not choose Mathematics because they have developed a fear of Mathematics because of their low pass mark in earlier years and their failure of the subject in Grade 9. The participants indicate that the learners believe that if they choose Mathematics in Grade 10, they will continue to fail Mathematics.

- **Sub-theme 2: Lack of motivation**

The findings of the study revealed that lack of motivation also discourages learners in choosing Mathematics as a subject. For example, Participant 1 indicated that the pass mark achieved in Grade 9 for Mathematics demotivates learners and prevents them from choosing Mathematics as a subject.

Participant 1*: Many learners do not choose Mathematics as a subject in Grade 10 because of lack of motivation. I have realised and concluded that many learners are psychological affected. Many of our learners are negatively influenced not to choose Mathematics because of lack of motivation and even laziness. I am very certain that if there is no motivation in learners it strongly reduces the interest of choosing Mathematics as a subject in Grade 10.*

The problem of demotivation caused by continuous failure of Mathematics was supported by Participant 2. According to Participant 2, learners are not motivated to choose Mathematics as a subject because they are psychologically affected by the constant failure in the subject.

Participant 2: *I have realised that many learners are not interested in choosing Mathematics as a subject in Grade 10 because they are demotivated. I have also realised that the learners are psychological affected.*

The lack of motivation as a reason for not choosing Mathematics as a subject in Grade 10 was also supported by Participant 3. Participant 3 however, indicated because learners influence each other, they tend not to choose Mathematics as a subject. This influence extends to developing a negative attitude towards Mathematics, especially if there is constant failure. In this regard, Participants 3 and 4 responded as follows:

Participant 3: *Learners can be motivated to work hard because they will know what is needed in every subject. Learners tend to influence one another and develop negative attitude towards Mathematics*.

The lack of interest in choosing Mathematics because of lack of motivation was also supported by Participant 4. According to Participant 4, many learners regard Mathematics as one of the more difficult subjects which requires them to work very hard.

Participant 4: *Many learners take Mathematics as one of difficult subjects in the world, because it needs more time and more energy. The learners are always told by the people that Mathematics is a difficult subject and it will destroy their future*.

According to the above responses, the participants emphasised that learners are influenced against taking Mathematics as a subject because of the complexity of the subject and the awareness of the hard work that needs to be put into the subject to ensure success. The worst part of it is that learners are influenced by their peers and others to reject Mathematics as a subject for the FET Phase.

- **Sub-theme 3: Laziness**

The findings of the study revealed that most learners do not choose Mathematics as a subject because of their laziness. This finding was confirmed by Participant 2 who indicated that learners do not choose Mathematics as a subject because they are lazy and reluctant to put in the effort to work hard. Participants 2 responded to the question as follows indicating that without Mathematics at Grade 12 level, entrance into tertiary education could be compromised.

Participant 2: *They do not like to work hard. I am not satisfied about the pass marks that are used by the school in South Africa because the learners are lazy to study knowing that they are going to work for less pass mark and it closes doors for more opportunities for learners to get admission to the tertiary level.*

The idea of laziness as the main reason of the learners for not choosing Mathematics was also supported by Participant 3. Participant 3 emphasised that many learners are not willing to put in the time, energy and commitment to work through a difficult and taxing subject such as Mathematics.

Participant 3: *Many learners in our schools do not like to choose Mathematics as a subject in Grade 10 because of their laziness. The minds of those learners are negatively affected because they do not want to work hard. Laziness has destroyed their minds and that is why they hate Mathematics.*

Laziness is seen as one of the causes of learners not choosing Mathematics as a subject in Grade 10 was also supported by Participant 4. According to the findings, Participant 4, learners are only motivated by laziness to refuse to choose Mathematics as their subject in Grade 10. Participant 4 also indicates that many teachers do not support the low pass mark because it does not motivate the learners to strive for a higher mark and pass Mathematics.

Participant 4: *Many learners do not choose Mathematics as a subject in Grade 10 because they are just lazy. We were all of us surprised because in many subjects, learners work hard but in Mathematics they are lazy. We have eventually discovered that they hate Mathematics because it requires them to work very hard. We are therefore not satisfied about the pass marks that are used by the school in South Africa, because it makes learners to become lazier.*

The findings revealed that all the participants indicate that many learners do not chose Mathematics as their subject as from Grade 10 because they are aware of the amount of work that needs to be put into the subject in order for them to be successful. The participants believe that the learners are reluctant to put in the effort required to study, and their laziness and lack of motivation has destroyed their minds. In addition, participants feel that the low pass mark has resulted in learners not wanting to strive for higher marks and thus greater success.

- **Sub-theme 4: Failing of Mathematics in Grade 9**

The findings of the study revealed that most learners do not choose Mathematics as a subject because of failing Mathematics in Grade 9. This finding was confirmed by Participant 1 who indicated that learners do not choose Mathematics as a subject because they failed mathematics in Grade 9.

Participant 1: *Learners do not choose Mathematics as a subject because of the pass mark which caused them to fail Mathematics in Grade 9. The learners cannot choose a subject in the next grade, which all of them failed. I think it is understandable. We must do something to ensure that our learners pass Mathematics; otherwise, they will*

all reject Mathematics in Grade 10 because they believe that they will fail in the next grades.

Participant 2 supported the idea that learners do not choose Mathematics because they failed in Grade 9.

Participant 2: *The learners are demotivated to choose Mathematics as a subject because they are always failing Mathematics in Grade 9 and their friends are not passing Mathematics. Failing Mathematics in Grade 9 is the main cause of the low number of learners who choose Mathematics in Grade 10. I am worried about this problem.*

Participant 3 also confirmed that failing Mathematics in Grade 9, is the major cause of very few learners choosing Mathematics in Grade 10. Participants 3 and 4 responded as follows:

Participant 3: *Many learners in our schools do not like to choose Mathematics as a subject in Grade 10, due to continuous failing of Mathematics in Grade 9. I have realised that many learners are not able to achieve the pass mark of Mathematics. Most learners told me that they work very hard but they failed Mathematics in Grade 9.*

Participant 4: *Our learners are no more interested in Mathematics because they always failed Mathematics in Grade 9. Our learners have concluded that they will never ever pass Mathematics in future and they always blame the pass mark. I also support what the learners say because there is no learner who can choose a subject that you don't pass.*

All the participants emphasised that learners do not choose Mathematics because of the results achieved in Grade 9. The participants indicate that many learners have failed Mathematics in Grade 9 year indicated by results in tests, assignments, projects and the final examination even though the pass mark is 40%. Therefore, all the participants emphasised that those learners do not choose Mathematics as a subject because they have failed Mathematics in Grade 9.

4.3.4 Main Theme 4: How Learners can be motivated to Choose Mathematics as a Subject in Grade 10

The participants were asked how they think learners could be motivated to choose Mathematics as a subject in Grade 10. The participants' responses revealed that learners could be motivated by using various teaching methods when teaching Mathematics, increasing the teaching time of Mathematics, creation and use of teaching and learning resources and ensuring the professional development of the teachers.

- **Sub-theme 1: Use a variety of methods when teaching Mathematics**

The study revealed that all participants indicated that learners can be motivated to choose Mathematics as a subject if teachers use various effective teaching methods and learning resources to ensure that learners participate and are engaged in the teaching and learning process. Participant 1, for example, revealed that learners can be motivated to choose Mathematics by using various teaching methods and providing effective teaching which interest learners. Participants responded as follows:

Participant 1: *They must work hard and try to use variety of methods when teaching instead of getting quick solutions. These will motivate learners to choose Mathematics as a subject in Grade 10.*

Participant 2: *Teachers should motivate learners to choose Mathematics as a subject by using a variety of methods when teaching Mathematics. They must also encourage them to work hard and reward them for good work.*

This perception was supported by Participant 3 who suggested the use of effective teaching methods would result in good performance of learners which motivates them to choose Mathematics as a subject. Participants 3 and 4 responded as follows:

Participant 3: *In order to motivate learners to choose Mathematics as a subject, the teachers must also use teaching methods that learners understand well. Teachers must not use only one teaching method but must use different teaching methods to ensure that learners understand Mathematics.*

Participant 4: *In order to motivate the learners to choose Mathematics as a subject, teachers must set effective teaching programmes and use effective teaching methods of Mathematics that will make learners pass Mathematics.*

All the four participants suggested that understanding of their learners and the use of a range of teaching methods, motivate learners to become engage in acquiring and developing Mathematical knowledge and skills which results in good achievement. Once learners achieve well, they are generally motivated to choose Mathematics as a subject in Grade 10.

- **Sub-theme 2: Teach extra hours or increase teaching time**

The findings of the study also revealed that if extra teaching hours were offered to learners or the teaching time of Mathematics was increased, learners would have the opportunity to spend more time on working through difficult sections, reinforcing previous work, ensuring that gaps were bridged. With extra lessons, learners might achieve better marks and pass the subject, which would then motivate them to choose Mathematics as a subject in the FET Phase. Participant 1 suggested the following:

Participant 1: *Teachers must motivate learners to choose Mathematics as a subject by teaching extra hours or adding more time for Mathematics in the time table, so that teachers and learners can have more time to practise it. This can be done by conducting afternoon lessons and attending weekend studies. More time will improve teaching and learning and the academic performance of the learners, which will motivate the learners to choose Mathematics as a subject.*

Participant 2 also supported adding extra hours or increasing teaching time of Mathematics, in order to motivate the learners to choose Mathematics as a subject. Participant 2 supported this perception by responding as follows:

Participant 2: *Teacher should motivate the learners to choose Mathematics as a subject by adding more teaching and learning time in Mathematics by afternoon and weekend studies. More teaching and learning time will improve the performance of*

teachers and learners, which will obviously motivate them to choose Mathematics as a subject.

The use of extra time was also supported by Participant 3 who emphasised that learners should attend afternoon, weekend and school holiday studies.

Participant 3: *It is important for teachers to motivate learners to choose Mathematics by adding more hours in teaching and learning of Mathematics. Teachers must encourage learners to attend afternoon and weekend studies and also during school holidays. They should always make the learners to understand that Mathematics is not difficult, you just need to practice or work hard.*

The use of extra time and adding more time was also confirmed by Participant 4 who suggested that the Department of Basic Education should adjust the Mathematics policy with regard to increasing the timeframe for teaching by offering lessons after school, during weekends and during school holidays to ensure that the curriculum is covered and that learners are given the opportunity to work through difficult aspects and address all problems so that they become proficient mathematicians.

Participant 4: *The learners should also be motivated to choose Mathematics by the Department of Basic Education. The Department must review Mathematics policy with regard to duration of teaching. More time should be added in teaching and Mathematics in all grades. Teachers should also motivate learners to love Mathematics by teaching extra hours, in the afternoon, during weekend and during school holidays. Teachers must ensure that learners pass Mathematics.*

The four participants proposed the increasing teaching time as the best strategy for ensuring that learners are well equipped with the relevant mathematical knowledge and skills which would result in greater achievement. Developing more confidence in Mathematics through exposure and practice and achieving a good pass mark would motivate learners to choose Mathematics. The participants emphasised that more time or hours should be added when teaching Mathematics in all grades, encourage learners to attend afternoon, weekend and school holidays studies.

- **Sub-theme 3: Creation and use of teaching and learning resources**

According to the findings of the study, teachers should use various teaching resources in order to motivate learners to become involved in the lessons. If learners are involved and actively engaged, the knowledge and skills will develop and result in better achievement in assessments which could motivate them to choose Mathematics as a subject in Grade 10. Participant 1 responded as follows:

Participant 1: *Supply the school with learning resources such as mathematical kit charts, drawings and abacus. These will motivate learners to choose Mathematics as a subject in Grade 10.*

The use of teaching and learning resources to motivate learners to become involved in Mathematics was also supported by Participants 3 and 4. Providing the learners with sufficient teaching and learning resources would motivate them and could improve their performance. With a good pass mark, learners would then choose Mathematics as a subject for the FET Phase.

Participant 3: *In order to motivate learners to choose Mathematics as a subject, teachers must offer learning resources to their children, and set programmes. The teachers must also use effective teaching resources when they teach Mathematics.*

Participant 4: *In order to motivate the learners to choose Mathematics as a subject, teachers must first offer sufficient learning resources to their children. The teachers must also ensure that they always use effective teaching methods when they teach Mathematics.*

Participants 1, 3 and 4 suggested that teachers should motivate learners to choose Mathematics by first using effective teaching methods and utlising appropriate learning resources, such as mathematical kits, charts, drawings and the abacus to ensure that the lessons come alive and that learners construct in depth knowledge and develop their skills. The participants also proposed that teachers should ensure that they regularly use effective teaching methods when they teach Mathematics, especially when introducing new sections and teaching difficult concepts.

- **Sub-theme 4: Professional development of teachers**

Another strategy of motivating learners to choose Mathematics in Grade 10, recommended by the Participants 2 and 3, is the regular professional development of the teachers. According to Participant 2, professional development should also be conducted in order to equip the teachers with knowledge and skills to effectively teach Mathematics. Participant 2 said the following:

Participant 2: *The Department should also organise workshops for teachers in order to improve the performance of the teachers. Workshops are very important for teachers because it can happen that the learners fail Mathematics because of the poor performance of the teachers themselves.*

This perception was supported by Participant 3 who emphasised that Mathematics teachers should receive further training in pedagogics in order to improve their teaching and thus the performance of learners in Mathematics. Participant 3 responded as follows:

Participant 3: *Teachers should also be trained in the content and methodology of Mathematics, especially in areas where learners are failing. This will improve the performance of learners and good performance of learners will motivate them to choose Mathematics as a subject.*

Participants 2 and 3 recommended continuous professional development of the teachers as another best strategy. Professional development refers to the use of various activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher. Therefore, the participants recommended that teachers should be trained in the content and methodology of Mathematics during preservice training but they continue with in-serve professional development to build their confidence and develop expertise especially in areas where learners are not effective by organising workshops for teachers and creating a community of practice with other Mathematics teachers.

4.4 ANALYSIS OF DATA COLLECTED FROM LEARNER FOCUS GROUPS

In this section, the data collected from four learner focus groups are presented, analysed and interpreted. A total of 20 learners from four schools participated in the focus groups. The focus groups are referred to as Focus Group 1, 2, 3 and 4. This is in compliance with the ethical considerations in section 3.8 that outlined that the names of all the participants as well as their places of work are not be revealed in the study. The responses of the participants are provided in verbatim form, supported by interpretations. The responses of the interview questions were categorised into the following four main themes and sub-themes:

Table 4.2: Themes and sub-themes emerging from the learner data

Main Theme	Sub-theme
1. The benefits of Mathematics	Develops the economy of South Africa Most careers need Mathematics
2. The role of the pass mark	To inform learners if they passed or failed Improve their levels of understanding Motivate learners to work very hard.
3. The influence of the pass mark on the choice of Mathematics as a subject in secondary schools	Failing Mathematics in Grade 9 Laziness Mathematics is hard Discouraged by elders/parents /brothers and sisters Low self-esteem
4. How learners can be motivated to choose Mathematics as a subject in Grade 10	Motivation of learners. Using effective teaching methods

The next section focuses on the presentation, analysis and interpretation of data collected from the teachers by means of focus group interviews. All the findings are categorised into main themes and sub-themes.

4.4.1 Main Theme 1: The Benefits of Learning of Mathematics

This theme emerged when groups were asked about the benefits of learning of Mathematics. This theme produced two sub-themes, namely that it develops the economy of South Africa and most careers need Mathematics.

- **Sub-theme 1: Mathematics develops the economy of South Africa**

The learners' responses revealed that they perceive the subject of Mathematics as very important because it develops the economy of South Africa and improves the lives of the people of South Africa. This statement is supported by the participants who also acknowledged that everything in life requires the knowledge of Mathematics.

Focus Group 1: *Mathematics gives us many skills. If we have many skills, our economy will grow and we will have better life. Yes, nowadays you cannot do anything without the knowledge and skills of Mathematics. It is important for everyone to do Mathematics because Mathematics give us skills and improve the economy of South Africa. Yes, we must all learn Mathematics. The government must lower the pass mark so that all of us can learn and pass Mathematics in order to get more knowledge skills and be able to grow the economy of South Africa.*

Focus Group 2: *Nowadays our economy and everything need Mathematics. We are living in the world of technology and it need technologist. Our economy is growing because of Mathematics. If we study and pass Mathematics, we shall be able to improve the economy of our country. We support that we must all learn Mathematics*.

Learners in Focus Group 3 also supported that the notion that Mathematics improves the economy of the country because many important careers in the varied industries of South Africa need the knowledge of Mathematics, as indicated by the learners of Focus Group 3:

Focus Group 3: *Most companies such as mines, hospital which are the most important in the economy of South Africa, require specialists who have better knowledge in Mathematics.*

The benefit of learning Mathematics in improving the economy was also supported by learners in Focus Group 4 who emphasised that there is currently a high rate of unemployment in the country as many people are not qualified or skilled and tend to have a lack of knowledge of Mathematics.

Focus Group 4: *Mathematics offers many opportunities. South Africa's rate of unemployment is high because most people don't have marketing skills required.*

Majority are unemployable because they don't have careers required for most jobs. We are living in the fourth industrial revolution which needs people with Mathematics in order for them to do multi jobs.

The learners in Focus Groups 1, 2, 3 and 4 emphasised that the importance of Mathematics in developing the economy of South Africa. The learners acknowledged that many industries and the majority of careers require some knowledge and skills of Mathematics, which is why Mathematics at school level is a crucial subject.

- **Sub-theme 2: Most careers need Mathematics (career development)**

The findings of the focus group data revealed that Mathematics is very important because it allows learners to study various fields as most careers require some knowledge of Mathematics. This perception was supported by the learners in Focus Groups 1 and 2 who indicated that Mathematics is vital for entry into future careers.

Focus Group 1: *Mathematics is very important because every career in the whole world need Mathematics. Because most jobs and careers need Mathematics and Mathematics is the key to all skills in the world. Most careers need Mathematics, so it will help us to get in a job or business in future. Life will be better if we had jobs.*

Focus Group 2: *We need to be scientists, engineers, doctors, so how will we get it without Mathematics. It is important for everyone to do Mathematics but it is important for all people to understand the basics while in primary. We must be allowed to take Mathematics even if we did not get the pass mark. We are told to take mathematical literacy if you do not get pass mark, who knows maybe we can improve in the next grade.*

The learners in Focus Groups 3 and 4 indicated that gaining a high achievement in Mathematics allows any student to enter in higher education institutions and study or train for any career, thus opening up many opportunities for the future.

Focus Group 3: *Getting an outstanding achievement in Mathematics gives you opportunity to study any course and get any job you want. Because many jobs that gives more money need Mathematics. Yes, because as we have said before many*

jobs that gives more money need Mathematics. Mathematics open more opportunities in life.

Focus Group 4: *Yes, Mathematics should be a compulsory subject to all learners as it gives many careers. Lots of good jobs with more money need Mathematics, for example engineers, doctors, scientist, accountants and technologist.*

All the learners in Focus Groups 1, 2, 3 and 4 indicated that Mathematics is very important subject as all the careers require the knowledge and skills of Mathematics. The learners emphasised that Mathematics could open doors for many careers and many prestigious jobs, vital to the economy, need Mathematics. This means that learners who have studied and passed Mathematics at Grade 12 level, have the opportunity to become scientists, engineers and doctors.

4.4.2 Main Theme 2: The Role of the Pass Mark

This theme was derived from the first research sub-question. The learners in the four Focus Groups were asked about the role of the pass mark in their schools. An analysis of the research findings produced the following sub-themes:

- **Sub-theme 1: To inform learners if they passed or failed**

The findings revealed that the main function of pass mark is to inform the learners if they have passed or failed Mathematics in the test or examination. The learners in Focus Group 1 supported this view and indicated that the role of pass mark is to indicate if they have passed or failed Mathematics. The learners in this group also recommended a Mathematics pass mark of 40%, in order to be admitted at universities. The following are the responses of the learners in Focus Groups 1 and 2:

Focus Group 1: *Pass mark helps us to achieve our goals. It guides us the marks required for the subject. It is important, as it help us to understand our abilities and level of understanding on a particular subject. The pass mark indicates to us a certain mark which decides the result at the end of every term, whether you passed or not. We want 50% pass mark in all the subjects in primary because one would find out earlier whether she is able or not and try to work hard. From Grade 10 to 12, 40% in all subject is needed because most people pass Mathematics with 30% but still don't*

get entry at university for careers of their choice. 50% pass mark is good in primary schools because the subjects are simple to understand. 50% as the pass mark is good, because one would find out earlier whether they are able or not. In secondary schools, 40% is good because the subjects are hard and takes time to understand but in Mathematics can be 30%. If there were no pass marks at school, even the teachers would be clueless depending to who passed or not.

Focus Group 2: *It is a rule that indicates if we have achieved or not. The pass mark also helps us to know if we have achieved or not in a particular subject. It is important for school to know those who passed or not.*

The learners in Focus Group 3 also responded that the role of pass mark is to indicate whether the learners are fit to be promoted to the next grade or to repeat that grade.

Focus Group 3: *Yes, it helps to show whether we are fit to be promoted to the next grade or still struggling, need to repeat the same assessment again. To check a learner's knowledge on what was learned, to check the qualifying learners for the next stage and to check learners that have pass or not at school. They enable learners to get the required admission to the next grade.*

The learners in Focus Group 4 indicated that the role of pass mark is to acquire certain knowledge which allows them to proceed to the next grade. However, they were aware that many tertiary institutions required a higher pass mark than 40% for entry into their programmes

Focus Group 4: *We are not satisfied because many careers and tertiary institutions required more marks than pass marks obtained. The role of pass marks in school is to allow us to reach certain marks in order for us to go the next grade. Pass mark shows us whether we qualify to go to the next grade. 50% pass mark is preferably in primary school. Learners must be taught to work hard.*

The learners in Focus Groups 1, 2, 3 and 4 indicated that the major role of the pass mark is to evaluate their performance and it therefore indicates whether they have

succeeded or not, thus being a benchmark, and whether they are fit to be promoted to the next grade or still struggling or need to repeat the grade.

- **Sub-theme 2: To improve their level of understanding**

The findings of the focus group data also revealed that the main function of the pass mark is to give both teachers and learners an idea of their proficiency and identify areas which need improvement. This perception was confirmed by Focus Groups 1 and 2 who responded as follows:

Focus Group 1: *Pass mark improves our level of understanding. Pass mark is therefore very important in improving our knowledge. We support that the pass mark must be 40% so that we are get better understanding of Mathematics and have better knowledge.*

Focus Group 2: *Yes, we support pass mark because it gives us knowledge of understanding. The higher the pass mark becomes, the higher is our knowledge we get.*

The learners in Focus Group 2 acknowledged that they strive to achieve the pass mark whether it is 40% or 50%. Achieving the pass mark and even surpassing it, motivates learners to improve their level of understanding because it will ensure that they achieve a high-quality education and as Focus Groups 3 and 5 indicate, will allow them access to higher education and entry into specific career fields.

Focus Group 3: *Mathematics improves our level of understanding and help us to be specialist in health, education, science and technology fields. We support that 50% should be the pass mark in primary because it will produce better learners with high level of understanding. In secondary schools we need 40% because things are difficult. When the pass mark is high, our country will produce specialist in the fields of health, education, science and technology.*

Focus Group 4: *This pass mark will help them even when they are in high school to improve their knowledge and understanding. It should depend on the subjects. In*

secondary schools, some can be 50%, for example, home languages, life orientation and 40% in other subjects.

The learners in Groups 1, 2, 3 and 4 emphasised that Mathematics is very important for all the learners because it improves their knowledge and understanding and enables the learners to gain access to careers in health, education, science and technology fields, amongst others.

- **Sub-theme 3: Motivate learners to work very hard**

According to the responses of the learners in the four Focus Groups, a pass mark in Mathematics has the important function of motivating learners to be committed to their studies, be conscientious and diligent and persevering even when things are difficult. This opinion was confirmed by the learners in Focus Groups 1, 2 and 3 who responded as follows:

Focus Group 1: *Yes, Mathematics is a very important subject because it encourages us to study hard. Pass mark also improves our level of understanding and make us to understand many things. Understanding the subject matter motivates us to work very hard in Mathematics and other subjects.*

Focus Group 2: *Pass mark is very important because it motivates us to work very hard in Mathematics and other subject in order to pass. Yes, we support pass mark because it helps us to work hard.*

Focus Group 3: *Yes, pass mark is very important in learning because it motivates us to work hard. We always work very hard in order to achieve the pass mark of Mathematics. We can only achieve the pass mark when we work very hard. Our friends who do not work very hard, always fail Mathematics and other subjects.*

Learners are aware that Mathematics needs hard work in order for them to achieve the pass mark which is a benchmark motivating them to achieve and surpass this target. Focus Group 4 responded as follows:

Focus Group 4: *Pass mark helps us to work as hard as we can in order to get that pass mark. This pass mark will motivate them even when they are in high school to pass with quality. That is the role of pass mark in Mathematics and other subjects.*

The four focus groups indicated that pass mark is very important for learners in schools. They emphasised that the pass mark motivates learners to work very hard and based on their results, are able to identify gaps in their learning which would then assist in improving their level of understanding.

4.4.3 Main theme 3: The influence of the Pass Mark on the choice of Mathematics as a Subject in Secondary Schools

This theme was derived from the main research question. The learners were asked about the influence of the pass mark on their choice of Mathematics as a subject in secondary schools. An analysis of the research findings**,** produced five sub-themes, namely, failing Mathematics in Grade 9, laziness, Mathematics is hard, discouraged by elders, parents, brothers and sisters and low self-esteem.

- **Sub-theme 1: Failing Mathematics in Grade 9**

The findings of the study revealed that learners do not want to choose Mathematics because they fear that they will fail Mathematics as from Grade 10. This view was confirmed by learners in Focus Group 1

Focus Group 1: *Our negative attitude towards Mathematics is many learners are failing Mathematics in Grade 9 and even those who passed, they passed at border line. We think this is because of our mentality, we don't believe we will make it because of many learners who are failing Mathematics in Grade 9. Yes, we are failing Mathematics even our brothers and sisters have failed it in Grade 10, so how can someone choose the subject that he or she will fail at the end of the year. To get 40% Mathematics in Grade 10 is difficult. They fear they won't make it in Grade 12.*

It seems that there is an inherent fear in choosing Mathematics because of what has previously happened with siblings who have failed Mathematics in Grade 10. This group believes that the pass mark of 40% is very high and it is difficult to achieve and

as such, it has developed their fear and low self-esteem of their ability as mathematicians.

Focus Group 2: *Yes, we are not taking Mathematics because we got low marks in Grade 9, below the pass mark that was needed. We don't have hope that one day we can pass it. Even if they can lower the pass mark, we would still fail Mathematics because of our negative attitudes.*

The learners in Group 3 also revealed their fear in choosing Mathematics. They realised that even with a low pass mark of 40%, many will not achieve a pass in Grade 10 and consequently will probably not be able to pass Grade 12. The learners in Groups 3 and 4 responded as follows:

Focus Group 3: *Yes, many of us were not able to reach pass mark in Grade 9 and this makes many of us to think that we won't be able to reach the pass mark in the next grade. We fear that Mathematics will make us fail in Grade 12. They must lower the pass mark to 30%. Mathematics will make us fail the grade. Many of us are scared by our peers who claim that Mathematics is difficult and is only done by geniuses.*

Focus Group 4: *Yes, the pass mark influences subject choice by allowing learners to do those subjects he/she choose after getting marks required. It shows if you qualify to do Mathematics or go for other subjects. Many learners are failing Mathematics and are not getting the pass mark.*

All the learners in the four focus groups revealed that the pass mark achieved in Grade 9, plays a major role in the choice that they make with Mathematics. The learners of the four focus groups indicated that as they did not achieve the low 40% pass mark in Grade 9, it is highly unlikely that they would make it in the next grades.

- **Sub-theme 2: Laziness**

The findings of the focus group data also revealed laziness as influencing the choice of Mathematics as a subject in secondary schools. The learners in Focus Groups 1 and 2 confirmed this perception and responded as follows:

Focus group 1: *We fail Mathematics because most of us are lazy. We also hope that even if the Department of Education can lower the pass mark of Mathematics, we shall not pass it because we have negative mentality towards the subject.*

Focus group 2: *The negative attitude towards the subject is the reason behind low number of us who are doing Mathematics. Mathematics need practise every day and we are lazy to do that.*

Learners are very aware of the effort that needs to be put into Mathematics as a subject in order to become skilled. However, they acknowledge that they are lazy and reluctant to put in the hard work and practice need to achieve well. Laziness then is considered as influencing the choice of Mathematics as a subject in the FET Phase, as indicated by learners in Focus Groups 1 and 2 only. These two groups emphasised that because of their negative attitude towards Mathematics, they do not practise daily and so do not achieve the pass mark. In addition, they do not believe that decreasing the pass mark will change their attitude towards the subject.

- **Sub-theme 3: Mathematics is hard**

The findings of the focus group data also revealed that the learners do not choose Mathematics as their subject because they perceive that Mathematics is a complicated subject and difficult to master. This view was supported by the learners in Focus Groups 1 and 3 who responded as follows:

Focus Group 1: *We think that Mathematics is a hard subject and both we and our parents develop negative attitudes towards the subject. We believe this because many people say that Mathematics is the difficult subject, but at the same time we think that it is all about hard work and dedication.*

Focus Group 3: *We believed that Mathematics is the difficult subject to understand in most school learning areas. We tried to work very hard but we don't pass and the only way is to leave Mathematics.*

The complexity of Mathematics is cited as a reason for rejecting Mathematics as their subject from Grade 10 and was emphasised by the learners in Focus groups 1 and 3. Mathematics is a very difficult subject to comprehend and as it becomes more

advanced and challenging, learners are required to work harder and practise longer to understand the more abstract concepts. Many learners cited Mathematics as 'tough' but with a good foundation from the previous phases, learners may be more prepared to choose it as a subject in Grade 10.

- **Sub-theme 4: Discouraged by elders, parents, brothers and sisters**

The learners in the focus groups also indicated that they do not choose Mathematics as their subject in Grade 10 because they have been discouraged by their elders, parents, brothers and sisters. This view was confirmed by the learners in Focus Groups 2 and 4.

Focus Group 2: *We have been told by our brothers, sisters and parents that we should not choose Mathematics as our subject. Our brothers, sisters and parents do not like Mathematics because of their negative attitude towards the subject. They told us if you want to pass Grade 12, leave Mathematics and do Mathematics literacy*.

This sentiment was confirmed by learners in Focus Group 4:

Focus Group 4: *Many learners are discouraged by their elders. They are told that Mathematics is difficult and they will fail it in Grade 12. They have mentality that keep on saying Mathematics is hard*

The learners in the two focus groups are adamant that they would never choose Mathematics as their subject in Grade 10 because in addition to not achieving the pass mark in Grade 9, they have been advised by their elders, parents and sibling not to choose Mathematics because it is difficult and it will compromise them achieving a pass mark in Grade 12.

- **Sub-theme 5: Low self-esteem.**

Another reason why learners do not choose Mathematics as their subject in Grade 10 is low self-esteem. This finding was revealed by the responses of the learners in Focus Groups 1 and 2:

Focus group 1: *Surely we don't believe we will pass Mathematics. Our low self-esteem and understanding contribute to the low number of us who are choosing*

Mathematics because even those who managed to get 40%, they are not choosing Mathematics in Grade 10.

Focus group 2: *We are now against Mathematics because of our low self-esteem against this subject. We believe that we are not fit to be doing Mathematics and therefore we don't like the subject. We have seen many bad things in this subject such as difficulty in understanding the subject and failing the subject and therefore we developed this low self-esteem against Mathematics.*

The learners in Focus Groups 1 and 2 emphasised their low self-esteem as the main reason behind rejecting Mathematics as their subject. Low self-esteem is an individual's subjective evaluation of their own worth and low self-esteem is characterised by a lack of confidence and feeling badly about oneself. People with low self-esteem often feel incompetent and it seems that these learners, who have failed to achieve the low pass mark of 40% in Mathematics at the Grade 9 level are convinced that they are unable to succeed as the subject becomes more abstract and challenging.

4.4.4 Main Theme 4: How Learners can be Motivated to Choose Mathematics as a Subject in Grade 10

This theme emerged from the question that the groups were asked of how learners can be motivated to choose Mathematics as a subject in Grade 10. An analysis of the data produced two sub-themes, namely motivation of learners and using effective teaching methods.

- **Sub-theme 1: Motivation of learners**

The findings indicated that learners can be motivated to choose Mathematics as a subject in Grade 10 but the love of Mathematics needs to be inculcated from an early age. Learners in Focus Groups 1 and 2 indicated that teachers should start motivating learners to choose Mathematics as a subject as from primary school level where a solid foundation of Mathematical knowledge and skills is built up year-by-year. In addition, the value and importance of Mathematics needs to be conveyed to learners so that they can see how this will affect their futures.

Focus Group 1: *The teachers must motivate us about the importance of Mathematics in South Africa. The teachers must start motivating us at primary school level so that we may take Mathematics as the most important subject. Teachers must motivate, as well as help us to understand Mathematics.*

Focus Group 2: *The only way to convince us to choose Mathematics is to motivate all of us to choose Mathematics. The teachers must tell all of us that Mathematics is the only way and without it there is no good life and the economy will never grow. The teachers must start motivating us at primary school.*

The learners in Focus Group 3 also supported the motivation of the learners as the best strategy of influencing the learners to choose Mathematics as a subject in Grade 10. The learners in Focus Group 3 suggested that teachers should motivate the learners by ensuring that the learners enjoy learning Mathematics in the classroom and provide them with sufficient time to understand and learn Mathematics.

Focus Group 3: *The teachers should have told us about the importance of Mathematics in South Africa. The teachers should also provide us with enough time in the time table in order to assist us and ensure that we understand Mathematics.*

Focus Group 4 learners indicated that teachers should ensure that learners pass Mathematics so that they are fully equipped to choose Mathematics as a subject in Grade 10.

Focus Group 4: *Teachers must ensure that learners pass Mathematics and motivate learners to work hard. If our teachers motivate us very well, we are ready to choose Mathematics. We have always believed that Mathematics is the method of destroying our future because many learners are failing Grade 12 because of Mathematics. We need to be convinced that we shall pass Mathematics.*

All the learners in Focus Groups 1, 2, 3 and 4 emphasised the need for motivation from teachers in order to convince them that Mathematics is important in their lives. All the learners in the various groups acknowledged that acquiring and developing the knowledge and skills required in Mathematics begins at a very early level and a

positive attitude with success in achievement through the years play a major role in motivating learners to choose Mathematics. Their responses imply that many learners are currently negative towards choosing Mathematics as a subject in Grade 10 because they believe that it is a difficult subject.

- **Sub-theme 2: Using effective teaching methods**

The findings of the focus group data revealed the use of effective teaching methods is one of the best strategies to motivate the learners to choose Mathematics as a subject in Grade 10. The learners in Groups 1 and 2 indicated that the use of relevant and effective teaching methods that support learners' development of Mathematics is vital in ensuring that they achieve well and are in a position to choose Mathematics as a subject in the FET Phase.

Focus Group 1: *Teachers must make sure that all of us understand what is taught, by using good teaching methods. Most of us are not interested in Mathematics because they don't know why they must learn a difficult subject which lowers their marks. The teachers must use effective methods that will make Mathematics easy to learn.*

Focus Group 2: *The teachers must also teach us in the way that we are able to pass Mathematics just like any other subjects. We are not interested in Mathematics because we don't understand what they teach us. Why are our teachers not able to use the methods that will make us understand Mathematics? We don't hate Mathematics but we don't understand what they teach us.*

In line with Focus Group 2, learners in Focus Group 3 indicated that Mathematics teachers should use effective teaching methods that will ensure that they enjoy the lessons which assist learners in developing understanding of the difficult concepts in Mathematics so that the subject is less challenging. Even as the content becomes difficult, teachers need to find ways of presenting the material in such a way that learners are engaged and involved using resources to scaffold their learning.

Focus Group 3: *Mathematics teachers should create enjoyable way of teaching and learning Mathematics. The teachers should also provide us with more resources in order to help us and ensure that we understand Mathematics.*

Learners, however, need to be aware that Mathematics needs time, effort, energy and persistence in order to be successful and that mathematics is a culminative discipline which means a foundation is necessary to build on and understanding at Grade 9 or 10 level is dependent on the depth of understanding developed at the Foundation, Intermediate and Senior Phases. Thus, appropriate teaching methods are vital in supporting learners at this level.

Focus Group 4: *The teachers must improve our performance in Mathematics by always improving their teaching methods. The teachers must also include practical activities when they teach Mathematics. Good teaching methods and practical activities will help us to understand and enjoy Mathematics.*

All the learners in the four focus groups agreed that one of the strategies that would motivate them to choose Mathematics as a subject is the use of effective teaching methods. The learners in these groups indicated that they do not hate Mathematics but their problem is that they do not understand Mathematics. The learners emphasised that teachers must use effective teaching methods to ensure that all learners understand what they teach, provide all learners with relevant learning resources, incorporate practical activities in all lessons, in order to ensure that all of them pass Mathematics and all these will ensure that learners choose Mathematics as a subject for the FET Phase.

4.5 CONCLUSION

In Chapter 4, the data emerging from the responses to the individual teacher interviews and learner focus group interviews were presented, analysed and interpreted. The data were presented in two sections. The first section presented data of responses from four teachers, while the second section presented data from four focus groups of learners. The thematic approach of qualitative data analysis was used to analyse all the qualitative data collected through the interviews. The analysis and

interpretation of the research findings revealed that there many agreements and very few disagreements between teachers and the learners. The teachers and the learners agreed that Mathematics is vital to learners as it develops knowledge as well as critical qualities, it creates a vast array of employment opportunities which improves the lives of South African and assists in developing the economy. The pass mark informs both teachers if learners have passed or failed and is noted as a valuable benchmark for progression to the next grade. In some cases, participants agreed that the pass mark motivates learners to learn seriously and enhance their academic performance in Mathematics, but in other cases, learners feel that the pass mark is too high and they are therefore demotivated when they fail, resulting in a negative attitude towards the subject. Even though the pass mark at 40% is low, learners fail Mathematics as they are lazy, lack motivation and do not make sufficient effort to meet the benchmark. All agreed that Mathematics at this level is difficult and challenging as it become more abstract. However, if learners have progressed to this phase with a solid foundation, they should progress well with teachers using a variety of effective teaching methods. In choosing Mathematics as a subject, learners are often discouraged by elders, parents, brothers and sisters not to choose the subject as they fear failure at Grade 12 level.

The findings also revealed that the teachers and learners disagreed in the following on a number of findings. Learners indicated that they are scared to choose Mathematics as a subject in Grade 10 but teachers feel that learners will benefit in the future from having studied the subject. The current pass mark is pegged at 40%- teachers want the pass mark to be increased to 50% while the learners want it decreased to 30%. The learners also indicated that teachers do not motivate them to choose Mathematics although the teachers suggested that in order to improve their marks and reach or surpass the pass mark, learners should attend extra classes in the afternoon after school, on Saturdays and during school holidays.

The above findings indicate that there are so many agreements and very few disagreements in the data collected from the teachers and learners.

This study concluded in Chapter 5 with a summary of the study, discussion of findings, recommendations and a final conclusion.

CHAPTER 5

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

The previous chapter focused on the presentation, analysis and interpretation of qualitative data collected through individual interviews and focus group interviews. The purpose of this study was to explore how pass mark influences the choice of Mathematics as a subject by Grade 10 learners in Groot Letaba Circuit. Specifically, this study was designed to answer the main research question: *How does the pass mark influence the choice of learners in Mathematics as a subject in Grade 10 learners in Groot Letaba Circuit?*

The following secondary research questions were formulated to answer the primary research question:

1. What are the benefits of learning Mathematics?
2. What is the role of the pass mark?
3. What is the influence of the pass mark on the choice of learners in Mathematics as a subject in secondary schools?
4. Which strategies can be implemented to motivate learners to choose Mathematics as a subject in Grade 10?

The above research questions were used as a reference point in designing the interview questions and the conclusion of this study is based on the above four research questions. Four Grade 10 teachers and 20 Grade 10 learners from four

secondary schools in the Groot Letaba Circuit of Mopani District in the Limpopo Province were interviewed.

This chapter presents the summary of research findings from teachers, summary of research findings from learners, contribution of the research and recommendations of the study.

5.2 SUMMARY OF RESEARCH FINDINGS

This study adopted a qualitative research approach using individual interviews with teachers and focus group interviews with learners to obtain information on the influence of the pass mark on the choice of Mathematics as a subject by Grade 10 learners in Groot Letaba Circuit of Limpopo Province. In this section, the findings from the data collected from both teachers through individual interviews and learners in focus groups, are presented. The findings of the study are interpreted in accordance with the research questions.

5.2.1 Research Question 1: What are the benefits of learning Mathematics?

Mathematics develops the knowledge, skills, new ideas, analytical thinking, reasoning, recording information and interpretation of information of the learners and promotes flexibility in solving challenges. People who have studied Mathematics are able to think deeply and favourably in their lives and it motivates them to resolve various challenges experienced in their lives, in comparison to the people who never studied Mathematics. This finding is supported by the (Department of Education, 2003), which emphasises that the study of Mathematics also contributes to personal development through a deeper understanding and successful application of its knowledge and skills, while maintaining appropriate values and attitudes.

Mathematics is very important because it allows the people to study various careers, as most careers require the knowledge and skills of Mathematics. In order to be professionals such as scientists, engineers, doctors, accountants, technicians and electricians, learners need to first possess a Grade 12 Mathematics pass. This implies

that people with the knowledge and skills of Mathematics are able to study any career. The role of Mathematics in allowing people access to study various careers is confirmed by (Akshay, 2018), who asserts that Mathematics open doors for many careers and learners who have studied Mathematics can become scientists, engineers, doctors or any other careers.

Mathematics is very important because it develops the economy of the country and improves the lives of the people. Mathematics develops the economy of South Africa by enabling the business sector to grow to a competitive level. In order to work effectively and grow industry and business companies, knowledge and skills of Mathematics is required. The role of Mathematics of improving the economy of South Africa is confirmed by (Ihechukwu and Ugwuegbulam, 2016), who emphasise that Mathematics is very important because it provides the essential knowledge and skills for improving the economy. House (2006) also emphasises that Mathematics improves the economy of the country because it as an essential component in preparing numerate citizens for employment and it is needed to ensure the continued production of highly-skilled persons required by industry, science and technology. This implies that more engineers, doctors, scientist, economist, accountants, businesses are produced when learners have a solid foundation of Mathematics.

Mathematics is also very important in the economy, contributing to a better life of the people because people who have mathematical knowledge and skills are offered many job opportunities in all walks of life, which thus reduces unemployment rate of the country. This finding is supported by the (Department of Education, 2003) which indicates that adequate knowledge and skills of Mathematics are vital components of socio-economic development because they reduce unemployment and enable people who studied Mathematics, to find suitable employment in South Africa.

Mathematics improves the economy of South Africa because Mathematics gives learners more choice in career opportunities and ensures that that country's own people are employed in every sector of careers rather hiring from beyond the country's borders. This finding is confirmed by (Pandor, 2006), who asserts that Mathematics serves as a gateway to future professions or careers in a variety of fields such as

physical science, engineering, computer science, life science, economic science, accountancy, environmental science or technology.

5.2.2 Research Question 2: What is the role of the pass mark?

The role of pass mark was prescribed by the (Department of Basic Education, 2017), which describes the number of points or progression requirements that must be achieved by a learner in order to be successful in a subject, examination or a level that a learner needs in order to be promoted to the next grade. This means that the main role of the pass mark is to gauge or evaluate the achievement of the learners and that the pass mark is the minimum mark required in the examination or a guiding tool that guide the school and the Department of Education to see the learners who passed and those who did not pass a subject. This implies that a pass mark is a benchmark that allows learners to pass subjects and without a pass mark, it will not be possible to see whether the learner should proceed to the next grade or not. Rezigalla, Abdalla, Mohammed and Alhassen (2017) asserts that a pass mark is a minimum mark which a candidate must achieve in order to be deemed to have successfully passed the assessment so that he or she can be promoted to the next grade.

According to the National Policy pertaining to the Programme and Promotion Requirements of the National Curriculum Statement (Grade R to 12), in order to pass a particular grade, a learner needs to achieve a particular pass mark in each subject (DBE, 2012). Any learner who does not obtain a particular pass mark is forced to repeat that particular grade or grade (DBE, 2012). The above functions of a pass mark are confirmed by (Umalusi, 2013), which asserts that the role of pass mark is to indicate the mark which a learner must achieve in order to pass a particular subject or grade. In other words, the pass mark evaluates if a learner understands a particular subject of his or her grade.

As the role of pass mark informs learners of whether they have passed or failed in the test or examination, in addition to indicating promotion to the next grade, this assists learners in setting goals, to determine their abilities and level of understanding of Mathematics, and enable them to reach a particular mark point. The pass mark is to improve the level of understanding of the learners and to enable them to become proficient in their choice of subject. Norcini (2013) describes the pass mark as a score that forms a limit between enough competent candidates and those who are not

competent. This indicates that the role of the pass mark is to show whether a person has acquired adequate specific knowledge.

Understanding that the pass mark is a benchmark, motivates learners and stimulating them to work very hard to either attain or surpass the pass mark. Based on this study's findings it was felt that Department of Basic Education should increase the pass mark of Mathematics at FET level in order to motivate learners to work at their maximum. This is confirmed by (Jansen, 2014) who emphasises that the pass mark for all school subjects should be raised to 50%.

5.2.3 Research Question 3: What is the influence of the pass mark on the choice of learners in Mathematics as a subject in secondary schools?

Mathematics, seen as a culminative discipline, is considered a most complicated and difficult subject and one of most difficult subjects, which needs more time, energy, effort and perseverance. This finding is confirmed by (Kaur, 2017), who asserts that even though Mathematics is an important subject with broad applicability to everyday life, it is often considered as a difficult subject in schools. According to (Boaler, 2016), even teachers and parents regard Mathematics as a hard subject that is inaccessible and uninteresting. Even though understanding of Mathematics at Grade 9 or 10 level is dependent on the depth of understanding developed at the Foundation, Intermediate and Senior Phases, Jameel and Ali (2016) who assert that most of the learners see Mathematics as a difficult and boring subject and therefore develop feelings of inferiority, hesitation and complex. This then affects not only their liking of Mathematics but also their perseverance, interest and self-efficacy beliefs related to Mathematics (Gafoor & Kurukkan, 2015). The learners thus do not like the subject because they believe that it is a difficult subject and they are not fit to do it. This finding is supported by (Colgan, 2014), who asserts that many learners feel Mathematics as a difficult, boring and disengaging subject and they hate Mathematics, and try to avoid it. According to (Boaler, 2016), even teachers and parents regard Mathematics as a hard subject that is inaccessible and uninteresting.

As early as the Foundation Phase, learners often start displaying negative attitudes towards learning Mathematics and this gradually develops into Mathematics anxiety (Hornigold, 2015). Those learners who have already conditioned their minds to the

notion that Mathematics is a difficult subject are usually not serious in the learning of Mathematics and therefore perform poorly in Mathematics tests and examinations (Ihendinihu, 2013). This perception is confirmed by (Nicolaidou and Philippou, 2003), who assert that negative attitudes of learners towards Mathematics are the result of frequent and repeated failure or problems when dealing with Mathematical tasks. According to (Effandi and Normah, 2009), passing Mathematics leads to a positive attitude towards Mathematics, while failing Mathematics leads to a negative attitude towards Mathematics. Papanastasiou (2000) claims that learners with a positive attitude will generally excel at Mathematics, while (Ma and Kishor, 2003) indicate that negative attitudes of learners towards Mathematics, negatively influence learners 'confidence in the subject.

Learners who have a negative attitude towards Mathematics result in them being fearful of the subject (Feza-Piyose, 2012). The learners have outright fear when they confront Mathematics. Many learners are afraid of choosing Mathematics as a subject in Grade 10 because of the negative influence of pass mark on the learners. The fear of Mathematics is supported by (Feza-Piyose, 2012), who emphasises that many learners are reluctant to choose Mathematics because they are not able to reach the pass mark in Grade 9. The fear of learning Mathematics is confirmed by (Ernest, 2015), who indicates that learners are scared of choosing Mathematics because of repeated failure of tasks and tests, reduced persistence and learning opportunities and poor confidence and anxiety. Swati (2020) indicates that Mathematics is a nightmare for most learners and they aim to just attain the pass mark in this subject. This indicates that many learners have a fear of Mathematics, feel stressed and anxious when they have to do Mathematics and that is why they want to avoid studying the subject. As a result, many learners are reluctant to choose Mathematics as a subject for the FET Phase because their pass mark causes them to fail. The learners are psychologically affected by always failing Mathematics (Boaler, 2016). This implies that the learners are scared to choose Mathematics because in the past, they scored low marks in previous grades. Even the few learners who have scored above 40%, are scared of doing Mathematics because they think that they were just lucky to score above 40% and therefore fear that in Grade 12, they will not be able pass Mathematics. In addition, learners are scared because they are intimidated by other learners who claim that Mathematics is a very difficult subject.

Learners' fear of Mathematics is reinforced by their parents, siblings and friends who have failed Mathematics in the past. This perception is supported by (Stuart, 2010) who argues that teacher, peer and family attitudes towards Mathematics may positively or negatively influence learners' confidence in Mathematics. According to (Furner and Duffy, 2002), parents who are afraid of Mathematics pass that on to their children and it is very difficult for learners to like Mathematics when their parents did not do well in Mathematics themselves. This implies that even a low Mathematics pass mark of 40% has developed their fear (maths phobia) and low self-esteem. This is supported by (Gafoor and Kurukkan, 2015), who emphasise that many learners have developed low esteem and fear of Mathematics.

It is therefore apparent that not achieving the pass mark of 40% at Grade 9 level has become a cause of maths phobia. Learners are wary of choosing Mathematics because failing the pass mark closes doors for admission to the tertiary level. This perception is confirmed by (Shay and Peseta, 2020), who indicates that learners do not choose Mathematics because failing Mathematics signals the closing of the doors of opportunities in tertiary level. Shay and Peseta (2020) further emphasises that performance in Mathematics matters for university entrance and without it, school leavers are not eligible for certain programmes at university such as in science or commerce. According to (Rose and Baird, 2013), university and career requirements are an important consideration for many learners because a large proportion of school learners have high aspirations for their future and as such, do not want to compromise their admission with a failure in Mathematics.

However, certain qualities have been identified with learner's attitude towards the subject. Lack of motivation strongly reduces the interest of choosing Mathematics as a subject in Grade 10. Many learners believe that Mathematics was designed for geniuses and with repeated failure in the subject during the years, have developed an inferiority complex, where they believe that they are not 'clever' enough to cope with the complex subject, and in addition, learners fear that they will eventually not be able to be successful in Grades 11 and 12. A further negative quality that was identified laziness which could also the influence on the choice of Mathematics as a subject in secondary schools. Learners acknowledged that they are lazy and not prepared to put in the time and effort to ensure that they acquire and develop Mathematical knowledge

and skills. Faridah (2004) indicates that hardworking learners with high levels of perseverance choose Mathematics as a subject because they are prepared to work very hard on a problem until they succeed in solving it. learners who are lazy and not prepared to work very hard are afraid to choose Mathematics as a subject (Faridah, 2004).

It seems that armed with all the issues identified above, learners are able to make an informed decision about whether to choose Mathematics for Grade 9 to take into the FET Phase. The learners realise that in many cases they have failed because of certain factors, as identified above, such as display of lack of confidence in their Mathematics ability and therefore have a negative attitude towards the subject. This then informs their decision of whether to choose Mathematics for Grade 10 or not.

5.2.4 Research Question 4: Which strategies can be implemented to motivate learners to choose Mathematics as a subject in Grade 10?

The importance of learning Mathematics as from primary school level could be discussed with learners with teachers explaining the value of having the mathematical knowledge and skills required for their future. This is supported by (Grous and Cabulla, 2000), who emphasise that understanding the significance of Mathematics determines the learners' attitudes towards Mathematics.

The manner in which a subject is presented is dependent on the teachers' subject content knowledge subject content knowledge (SCK) as well as pedagogical content knowledge (PCK) (Shulman, 1987). A teacher who is well-trained, experienced and can draw upon vast subject content knowledge and use a variety of teaching methods and strategies, understanding that these are necessary to reach the varying types of learning styles of the learners, will most probably be successful in motivating their learners to achieve well and thus choose Mathematics.

This means learners can be motivated to choose Mathematics by using a variety of effective teaching methods and programmes that learners understand well and contribute to good performance of learners. Many learners do not choose Mathematics as their subject for a myriad of reasons as stated above, but particularly if the teacher uses one or similar teaching method such as chalk-and-talk or is text-book bound, the

learner will not develop the needed depth of understanding. Teachers should motivate learners acting as a mediator of learner-centred learning using a combination of teaching methods in one lesson; for example, discussion, experimentation and inquiry-based strategy. This is confirmed by (Hamamorad, 2016) who asserts that a teacher is responsible for mediating learning by adopting various teaching methods which promote interaction between teacher and learners and facilitating learner-learner interaction. According to (Suurtamm *et al.,* 2015), teachers should create an inquiry-based learning environment when they teach Mathematics. An inquiry-based learning environment occurs when learners take an active role in learning, and the teacher's role becomes more of a curator of the learning process (Suurtamm *et al.,* 2015).

Teachers should create and use a variety of teaching and learning resources that capture their learners' interest and spike motivation, such as mathematical kit charts, drawings, the abacus and technology. Effective teaching methods ensure that all the learners understand what is being taught and are well equipped to pass Mathematics just like any other subject. MacMath, Wallace and Xiaohong (2009) emphasise that, Mathematics teachers should use effective teaching methods in Mathematics and one of them is collaboration. Different examples of technology can also be used in the Mathematics classroom and include online assessment tools, online collaboration tools, computer algebra systems, apps, calculators, computer applications, and interactive whiteboards (Tamin *et al.,* 2011). Gadanidis and (Geiger, 2010) emphasise that utilising technology when teaching Mathematics can support learners in procedural skills, problem solving and reasoning. Colgan (2014) emphasises that teachers should motivate learners to learn Mathematics by using educational apps such as Kahoot, mathematical games such as Mathemagic or the prime radicals' game, television programs such as the TVO kids programme and the prime radicals, stories and books that incorporate Mathematics, such as Mathemagic and number tricks. Providing learners with sufficient resources assists them in understanding and enjoying Mathematics fully. This means including good practical activities, a sentiment supported by (Unal, 2017), who emphasises that teachers should use various teaching and learning resources such textbooks, technology and games to assist learners to understand mathematical concepts.

To ensure that learners have the opportunity for extra work or to address issues identified in areas of Mathematics, teachers should not depend only on the time-table but increase the teaching time of Mathematics with extra lessons after school or clinics and workshops over the weekend or school holidays, giving learners more time to practise. More time will improve teaching and learning and the academic performance of the learners. Increasing teaching time of Mathematics is supported by (Grouws and Cabulla, 2010), who assert that the Mathematics teachers should improve their teaching effectiveness by regularly extending teaching time of Mathematics. These views are supported by the (Bill and Melinda Gates Foundation, 2010), which emphasises that learners should be provided with additional instructional time and regular support. Schmidt, McKnight and Raizen (2007) indicate that it is prudent to allocate sufficient time for Mathematics at every grade level and short class periods of about 30-35 minutes in Mathematics, instituted for whatever practical or philosophical reason, should be reconsidered.

Professional development of the teachers equips teachers with knowledge and skills for the effective teaching of Mathematics, which motivates the learners to love and choose Mathematics. Mizell (2010) recommended that professional development should focus on teachers developing understanding of the needs of their learners. Professional development assists in developing teachers in their profession, expanding their knowledge, skills, attitudes and beliefs related to their teaching practices (Ching-Yun, 2008). In order to be well prepared with both subject content knowledge (SCK) and pedagogical content knowledge (PCK) (Shulman, 1987), teachers need to continue to improve their knowledge and skills throughout their careers. It is thus the qualified and experienced teacher, who through effective teaching of Mathematics, will ensure that the learners acquire and develop mathematical knowledge and skills to succeed in lower grades, and thus choose Mathematics as a subject in Grade 10 to take into the FET Phase.

5.3 RECOMMENDATIONS FOR PRACTICE

- **Recommendation 1: Use of varied teaching methods to motivate learners:**

It is recommended that teachers should motivate learners by implementing effective teaching methods. Teachers must use effective teaching methods which ensure that

all the learners understand what is taught and are thus given the opportunity to acquire and develop a deep understanding of the various topics of Mathematics. Such teaching methods should include a learner-centred approach with many practical applications. Learners need to developing understanding of the value of learning a difficult subject and come to love it as it could allow them access to a variety of careers in the future.

- **Recommendation 2: Using effective teaching and learning resources:**

It is recommended that teachers should improve teaching and learning of Mathematics by using effective teaching and learning resources, such as text books, graphs, tables, computers, calculators and workbooks. Abundant use of teaching and learning resources gains the attention of learners in the learning processes and assists the teachers to sustain the involvement of learners in learning. It is recommended that teachers should use the teaching and learning resources regularly in order to give learners hands-on experience that helps them construct useful meanings for the mathematical ideas they are learning.

- **Recommendation 3: Extension of teaching time of Mathematics**

Learners can be motivated to develop greater understanding of Mathematics attending teaching extra hours or increasing the teaching time of Mathematics so that so that learners can have more time to practise and address any problem areas.

- **Recommendation 4: Professional development of teachers**

It is recommended that teachers should improve teaching and learning of Mathematics by attending professional development sessions conducted by instructional leaders. Effective professional development equips the teachers with knowledge and skills of effective teaching of Mathematics, which motivates the learners to love and choose Mathematics.

5.4 RECOMMENDATIONS FOR FUTURE RESEARCH

This study focused on how the pass marks influence the choice of Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit of Mopani District in Limpopo Province. Since the study focused on the secondary schools in the Groot Letaba

Circuit of Mopani District only, it is recommended that similar studies should be extended to other areas of the Mopani District or even the other districts of the Limpopo Province.

5.5 LIMITATIONS OF THE STUDY

While implementing this research, particular restrictions of the study were experienced. The researcher experienced the following limitations of the study:

This study was limited to one district (Mopani) only, out of five districts of Limpopo Province and one circuit out of twenty-nine circuits of Mopani District due to time financial constraints. The researcher believes that these limitations have reduced the universality of the research results. In future, the research could be expanding the research to include additional districts of Limpopo Province. The generalisability of the research findings was limited by conducting the study in five secondary schools only. To avoid this limitation, the study could be extending to more schools in the Groot Letaba Circuit of Mopani District.

Despite all the restrictions of this study, I am confident that the results of this research will motivate the learners to take Mathematics as a subject in secondary schools.

5.5 CONCLUSION

This study explored the perceptions of teachers and learners on how the pass mark influences the choice of Mathematics as a subject by Grade 10 learners in the Groot Letaba Circuit of the Mopani District of Limpopo Province. Chapter 5 presented the summary, findings and recommendations of the study.

The findings of this study revealed that many learners are reluctant to choose Mathematics for the FET Phase for a number of reasons which includes lack of self-confidence, fear of the subject, fear of failure in future grades and because they did not achieve the pass mark of Mathematics in Grade 9. If learners come through the various school phases with a good foundation of Mathematics and qualified, experienced teachers apply effective teaching methods, use practical resources and extend the time of teaching and learning Mathematics, there is a possibility that

learners will develop more confidence in the subject, attain the pass mark which will motivate them to choose Mathematics as a subject in Grade 10.

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APPENDICES

Appendix A: Ethical clearance

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2019/11/13

Ref: **2019/11/13/45825122/51/AM**
Name: Mrs SJ Magwaza
Student No.: 45825122

Dear Mrs SJ Magwaza

Decision: Ethics Approval from 2019/11/13 to 2022/11/13

Researcher(s): Name: Mrs SJ Magwaza
E-mail address: joysomisa@gmail.com
Telephone: 0736520111

Supervisor(s): Name: Prof. M. J Taole
E-mail address: taolemj@unisa.ac za
Telephone: 012 4293541

Title of research:

The influence of the pass mark on the choices of mathematics as a subject by grade 1o learners at Groot Letaba Circuit

Qualification: MEd Curriculum and Instructional Studies

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2019/11/13 to 2022/11/13.

*The **low risk** application was reviewed by the Ethics Review Committee on 2019/11/13 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.

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

3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after the expiry date **2022/11/13**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number **2019/11/13/45825122/51/AM** *should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

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

Prof PM Sebate
ACTING EXECUTIVE DEAN
Sebatpm@unisa.ac.za

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

Appendix B: Letter to the HOD: Limpopo Department of Basic Education requesting permission to conduct research

UNISA college of education

Enquiries: Magwaza SJ
Contact: 0736520111
Email:joysomisa@gmail.com

P.O. Box 5128
Giyani, 0826

25 October 2019

The Head of Department
Limpopo Department of Basic Education
Strategic Planning and Research
Private Bag
Polokwane, 0970

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN GROOT LETABA CIRCUIT

1. I, Magwaza S. J and I am doing research under the supervision of Professor Taoele M. J, a Professor in the Department of Curriculum and Instructional Studies towards a Master degree at the University of South Africa. I am requesting permission to conduct the research in four secondary schools in Groot Letaba Circuit. I am currently an teacher in Groot Letaba Circuit
2. The topic of my research is "*The influence of the pass mark on the choice of learners in Mathematics as a subject in grade 10 learners in Groot Letaba Circuit*."
3. This study has received written approval from the Research Ethics Review Committee of the University of South Africa.
4. The participants of the study consist of 4 teachers and 20 Grade 10 learners from four selected schools in the Groot Letaba Circuit of the Mopani District of Limpopo Province.
5. Interviews will be used to collect information and they will be conducted after school hours.
6. The researcher will adhere to the ethical standards of research, which include voluntary participation, informed consent, confidentiality and minimisation of risks.
7. For any enquiries you can contact me at 0736520111 or my supervisor at 012 429 3541.

Yours Faithfully

……Magwaza SJ……

Appendix C: Letter from Limpopo Department of Basic Education granting permission to conduct research

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

Ref: 2/2/2 Enq: Mabogo MG Tel No: 015 290 9365 E-mail:MabogoMG@edu.limpopo.gov.za

Magwaza SJ
P O Box 5128
Giyani
0826

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

1. The above bears reference.
2. The Department wishes to inform you that your request to conduct research has been approved. Topic of the research proposal: **"THE INFLUENCE OF THE PASS MARK ON THE CHOICES OF MATHEMATICS AS A SUBJECT BY GRADE 10 LEARNERS AT GROOT LETABA CIRCUIT "**
3. The following conditions should be considered:

3.1 The research should not have any financial implications for Limpopo Department of Education.

3.2 Arrangements should be made with the Circuit Office and the School concerned.

3.3 The conduct of research should not in anyhow disrupt the academic programs at the schools.

3.4 The research should not be conducted during the time of Examinations especially the fourth term.

3.5 During the study, applicable research ethics should be adhered to; in particular the principle of voluntary participation (the people involved should be respected).

3.6 Upon completion of research study, the researcher shall share the final product of the research with the Department.

REQUEST FOR PERMISSION TO CONDUCT RESEARCH: MAGWAZA SJ

CONFIDENTIAL

Cnr. 113 Biccard & 24 Excelsior Street, POLOKWANE, 0700, Private Bag X9489, POLOKWANE, 0700
Tel: 015 290 7600, Fax: 015 297 6920/4220/4494

The heartland of southern Africa - development is about people!

4 Furthermore, you are expected to produce this letter at Schools/ Offices where you intend conducting your research as an evidence that you are permitted to conduct the research.

5 The department appreciates the contribution that you wish to make and wishes you success in your investigation.

Best wishes.

Ms NB Mutheiwana
Head of Department

27/11/2019
Date

REQUEST FOR PERMISSION TO CONDUCT RESEARCH: MAGWAZA SJ

CONFIDENTIAL

Appendix D: Letter to the principal requesting permission to conduct research in the school

Enquiries: Magwaza SJ
Contact: 0736520111

P.O. Box 5128
Giyani, 0826
25 October 2019

The School Principal

…….Secondary school

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT YOUR SCHOOL

I Magwaza SJand I am doing research under the supervision of Professor Taole M.J, a Professor in the Department of Curriculum and Instructional Studies towards a Master Degree at the University of South Africa. I hereby request permission to conduct research at your school. The title of my dissertation is "*The influence of the pass mark on the choice of learners in Mathematics as a subject in grade 10 in Groot Letaba Circuit*." The aim of this research is to explore how the pass mark influences grade 10 learners to select Mathematics as a subject in grade 10. The findings of this study will motivate Grade 10 learners to choose Mathematics as a subject in Grade 10 and also improve the performance of learners in Mathematics.

One teacher and 5 learners from your school will be selected to participate voluntarily in this study. Individual interviews and focus group interviews will be used to collect the data from the teachers and learners respectively. The interviews will be conducted after school hours and there will not be any disruption of their work. In this study, there are no potential risks facing the participants of the study. The researcher will also adhere to the ethical standards of research which include voluntary participation, informed consent, confidentiality and minimisation of risks. The names of your school, teacher and learners will not appear in any research report.

In this study, there will be no reimbursement, reward or any incentives for participating in the research and the participants will not incur any costs. At end of the project, the school will be given the research feedback and the feedback procedure will entail provision of summary of the research findings to the schools. For any enquiries you can contact me at 0736520111 or my supervisor at 012 429 3541.

Thank you very much for reading this letter.

Yours Faithfully

Magwaza SJ
……

Appendix E: letter to the teachers requesting their participation in the study

UNISA college of education

Enquiries: Magwaza SJ
Contact: 0736520111

P.O. Box 5128
Giyani, 0826

25 October 2019

Dear Sir/ Madam,

INVITATION TO PARTICIPATE IN RESEARCH

1. I, Magwaza S.J and I am doing research under the supervision of Professor Taoele M.J, a Professor in the Department of Curriculum and Instructional Studies towards a Master Degree at the University of South Africa, working on a dissertation with the title: "*The influence of the pass mark on the choice of learners in Mathematics as a subject in grade 10 learners in Groot Letaba Circuit*."
2. I hereby cordially request you to voluntarily participate in an academic research which I will conduct at your school.
3. The participants of this study are 1 teacher and 5 Grade 10 learners from your school. You are requested to participate in the interviews and the interviews will be conducted after school. The aim of the interviews is to seek evidence that will assist in motivating Grade 10 learners to choose Mathematics as a subject. Your participation in this study is voluntary and you are free to withdraw at any time without any consequences.
4. There is no risk involved in participating in the study and your names will not be mentioned in any of the reports about the study. A report of the study may be submitted for publication, but the names of participants will not be identifiable in such a report.
5. Hard copies of interview transcripts and analysed data will be securely stored for five years in the filing cabinet.
6. There will be no reimbursement, reward or any incentives for participating in the research and the participants will not incur any costs.
7. In case of any inquiry, you are free to contact me telephonically at 0736520111 or my supervisor ta 012 429 3541 and if you are willing to take part in this study, please complete the attached consent form.

Yours Faithfully

……Magwaza SJ……..

Appendix F: Consent form

CONSENT/ASSENT TO PARTICIPATE IN THIS STUDY (Return slip)

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

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

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

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

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

I agree to the recording of the interview.

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

Participant Name & Surname (please print) _____

_____ _____

Participant Signature Date

Researcher's Name & Surname (please print) ___Magwaza S.J_____

_____ _____

Researcher's signature Date

Appendix G: Letter to the learners requesting their participaion in the study

UNISA college of education

Enquiries: Magwaza SJ
Contact: 0736520111

P.O. Box 5128
Giyani, 0826

25 October 2019

Dear learner

INVITATION TO PARTICIPATE IN FOCUS GROUP INTERVIEW

My name is Somisa Joyce Magwaza, and I am doing researcher under the supervision of Professor Taoele M. J, a Professor in the Department of Curriculum and Instructional Studies towards a Master Degree at the University of South Africa. I ask you to participate in a focus group interview on the…… November 2019 and you will be in a group of 5 Grade 10 learners. The interview will not last more than 1 hour. I am trying to learn more about why learners are not interested in choosing Mathematics as a subject in Grade 10. I will come and ask questions to you as a group. You will discuss the questions and give me one answer to the question.

I will also ask your parents if you can take part. If you do not want to take part, it will also be fine with me. Remember, you can say yes or you can say no and no one will be upset if you don't want to take part or even if you change your mind later and want to stop. If you want to ask me any question, you are free to ask me. Please speak to parents or guardian about taking part before you sign this letter. Signing your name at the bottom means that you agree to be in this study. A copy of this letter will be given to your parents.

Regards

S.J Magwaza

Your name:	Yes I will take part	No I don't want to take part
Date:		
Witness:		

Appendix H: Letter to parents requesting permission for the learners to participate in the study

Enquiries: Magwaza SJ
Contact: 0736520111

P.O. Box 1750
Giyani, 0826

25 October 2019

Dear parent

My name is Somisa Joyce Magwaza and I am doing research under the supervision of Professor Taoele M. J, a Professor in the Department of Curriculum and Instructional Studies towards a Master Degree at the University of South Africa. I hereby cordially request your child to voluntarily participate in a one-day focus group interview of 5 Grade 10 learners, which I will conduct for one day at their school. The interview will be conducted after school and will not take more than an hour. I am trying to learn more about why learners are not interested in choosing Mathematics as a subject in Grade 10. The aim of the interviews is to seek evidence that will assist in motivating Grade 10 learners to choose Mathematics as a subject. I will go and conduct interviews after school, at your school. The learners will discuss the questions and give me one answer to the question.

Your child' participation in the interview is voluntary and you are free to withdraw at any time without any consequences. There is no risk involved in participating in the interview. If you give your child permission to take part in the focus group interview, please complete the attached consent form. In case of any inquiry, you are free to contact me telephonically at 0736520111 or my supervisor at 012 429 3541.

Yours Faithfully
Magwaza SJ…

Appendix I: Consent/assent form

CONSENT/ASSENT TO PARTICIPATE IN THIS STUDY (Return slip)

I, _____ (parent's name), give permission to my child to participate in the focus group interview.

I have read and understood the aim of the interview and how the focus group interview will be conducted.

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

I agree to the recording of the interview and that the interview will not take more than an hour.

Parent's Name & Surname (please print)

_____Signature……..Date…….

Researcher's Name & Surname (please print) _____Magwaza SJ_____

Signature……..Date…….

Appendix J: Interview schedule for teachers

INTERVIEW SCHEDULE

THE INFLUENCE OF THE PASS MARK ON THE CHOICES OF MATHEMATICS AS A SUBJECT BY GRADE1O LEARNERS AT GROOT LETABA CIRCUIT

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ood afternoon. Firstly, I want to thank you for granting me permission to interview you. The purpose of this interview is to request your opinions about the influence of the pass mark on the choices of Mathematics as a subject by Grade 10 learners. I request to tape-record the interview so that I do not miss any part of our deliberations. I fear that I might miss something valuable or even somehow change your words unintentionally when I rely on note taking. The success of this interview is dependent on your honest responses and comments. There is no right or wrong answer and please feel free to express your opinions with regard to the influence of the pass mark on the choices of Mathematics as a subject by Grade 10 learners. Is there any question or comment before we commence?

INTERVIEW QUESTIONS

1. Explain the role of pass mark in the schools.
2. Are you satisfied about the pass marks that are used by the schools in South Africa? Explain why you are satisfied or not satisfied.
3. In South Africa, the choice of subjects starts from Grade 10. Are you satisfied about this procedure? Explain why you are satisfied or not satisfied.
4. Explain how the pass mark influence the choice of subjects such as Mathematics in your school?
5. Explain the reasons why learners in many schools do not like to choose Mathematics as a subject?
6. What do you think are the benefits of Mathematics for South Africa?
7. In your opinion what are the benefits of learning Mathematics?
8. What is the role of the teachers in motivating learners to choose Mathematics as a subject in Grade 10?
9. Explain how the parents can motivate learners to choose Mathematics as a subject in Grade 10?

10. Explain strategies that should be implemented by the Department of Education to motivate learners to choose Mathematics as a subject in Grade 10?

Thank you very much for your time and contributions. May God bless you.

Appendix K: Focus group interview schedule

INTERVIEW SCHEDULE FOR GRADE 10 LEARNERS

FOCUS GROUP INTERVIEW SCHEDULE

THE INFLUENCE OF THE PASS MARK ON THE CHOICES OF MATHEMATICS AS A SUBJECT BY GRADE1O LEARNERS AT GROOT LETABA CIRCUIT

Good afternoon. Firstly, I want to thank you for granting me permission to interview you. The purpose of this focus group interview is to request your opinions about the influence of the pass mark on the choices of Mathematics as a subject by Grade 10 learners. I request to tape-record the interview so that I do not miss any part of our deliberations. I fear that I might miss something valuable or even somehow change your words unintentionally when I rely on note taking. The success of this interview is dependent on your honest responses and comments. There is no right or wrong answer and please feel free to express your opinions with regard to the influence of the pass mark on the choices of Mathematics as a subject by Grade 10 learners. Is there any question or comment before we commence?

INTERVIEW QUESTIONS

1. What do you think is the function of pass mark in the schools?
2. Do you support the use of pass marks in the schools? Explain why you support it or do not support it.
3. In South Africa, the learners choose subjects as from Grade 10. Do you support it? Explain why you support it or you don't support it.
4. Do you think pass mark is to blame for very low number of learners who choose Mathematics as a subject in Grade 10?
5. Explain why you think there are very few learners who choose Mathematics as a subject in many schools in South Africa.
6. Explain why Mathematics is regarded as very important subject in South Africa and the whole world?

7. Do you think it is important for all learners to do Mathematics? Explain why you think so.
8. Briefly explain the Mathematics pass mark that you prefer in the primary schools.
9. Explain briefly about the pass mark that you prefer from Grade 10 to 12.
10. Explain what the teachers must do to influence the learners to choose Mathematics as a subject in Grade 10?

Thank you very much for your time and contributions. May God bless you.

Appendix L: Proof of editing

To whom it may concern

This letter serves to confirm that editing and proofreading was done for:

SOMISA JOYCE MAGWAZA

Student number: 45825122

Curriculum Studies

Faculty of Education

University of Pretoria

Master's Dissertation

The Influence of the Pass Mark on the choice of Mathematics as Subject by Grade 10 Learners in the Groot Letaba Circuit

Cilla Dowse
26 June 2021

Cilla Dowse PhD in Assessment and Quality Assurance in Education and Training: University of Pretoria 2014 Programme on Editing Principles and Practices: University of Pretoria 2009 Basic Editing and Proofreading: McGillivray Linnegar Associates 2008 Professional Editors' Guild Associate Member, DOW003	Rosedale Farm P.O. Box 48 Van Reenen Free State cilla.dowse@gmail.com Cell: 084 900 7837

Appendix M: Turnitin report

Turnitin Originality Report

- Processed on: 01-Jul-2021 09:58 SAST
- ID: 1614492543
- Word Count: 31759
- Submitted: 1

Revision 2: Complete dissertation/thesis for examination By S J MAGWAZA

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Makhubele, Evolinah. "Exploring challenges faced by grade four teachers in the implementation of reading practices in the Mano'mbe Circuit of the Mopani district", 2015
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< 1% match (Internet from 09-Nov-2018)
http://uir.unisa.ac.za/bitstream/handle/10500/21800/dissertation_gwija_m.pdf?i=&sequence=1
< 1% match (Internet from 08-Sep-2017)
http://uir.unisa.ac.za/bitstream/handle/10500/22747/thesis_dei_dj.pdf?isAllowed=y&sequence=1
< 1% match (Internet from 05-Aug-2020)
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< 1% match (Internet from 08-Apr-2016)
http://uir.unisa.ac.za/bitstream/handle/10500/11876/dissertation_chirinda_b.pdf?isAllowed=y&sequence=1
< 1% match (Internet from 03-Sep-2020)
http://uir.unisa.ac.za/bitstream/handle/10500/26632/dissertation_ralane_mk.pdf?isAllowed=y&sequence=1
< 1% match (Internet from 05-Sep-2019)
http://uir.unisa.ac.za/bitstream/handle/10500/19681/thesis_maponya_sh.pdf?sequen=
< 1% match (Internet from 26-Feb-2020)
http://uir.unisa.ac.za/bitstream/handle/10500/13183/dissertation_mupara_lm.pdf?isAllowed=y&sequence=1
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Submitted to University of the Free State on 2013-12-16
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Submitted to University of the Free State on 2020-06-17
< 1% match (student papers from 23-Jul-2019)
Submitted to University of the Free State on 2019-07-23
< 1% match ()
Minty, Rehana. "Infusing information and communication technologies (ICTs) into the teaching and learning of mathematical literacy", 2012
< 1% match ()
Keble, Jo-Anne. "An investigation into the low pass rate in science and mathematics in selected schools in the northern areas, Port Elizabeth", Faculty of Arts, 2012
< 1% match ()
Rapakwana, Ngwako Johannah. "The effect of a provincial communcation strategy to address HIV, AIDS, STIs and TB (HAST) in the Limpopo Province", 2018
< 1% match ()
Okitowamba, Onyumbe. "Tracking learners' performances in high-stakes Grade 10 mathematics examinations", University of the Western Cape, 2016
< 1% match ()
Jeram, Ramesh. "On bridging the gap between theory and practice: a conceptual analysis of practice in relation to a teacher professional learning programme at Stellenbosch University", Stellenbosch : Stellenbosch University
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