

**Exploring factors influencing Grade 7 learners' performance in Mathematics in
the Frances Baard District**

By

FATIMA AJIMUDIN

2016341345

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DECLARATION

I declare that *Exploring factors influencing Grade 7 learners' performance in Mathematics in the Frances Baard District* is my own work, that it has not been submitted for any degree or examination in any other university. All sources or quotations mentioned in this work have been fully acknowledged by the researcher.

Signed 


November 2021

Fatima Ajimudin

Supervisor 

November 2021

Dr K.R. Mukuna

Co-Supervisor 

November 2021

Ms S.L. Baloyi-Mothibeli

DEDICATION

- To the teachers of South Africa
- To the children of South Africa
- To Asadullah Ajimudin (the late)
- To Yusuf Ajimudin
- To Summayyah Ajimudin
- To Batool Ajimudin
- To Nusrat Ajimudin
- To Rahmat Ajimudin

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ABSTRACT

The performance of learners who reach Grade 7 level tends to decline owing to a number of factors. Presently, learners from more impoverished communities are denied access to the trending resources, which places them at a disadvantage. Psychological factors, social and academic factors affect learners and this impacts

their academic performance. Learners who reach Grade 7 are in the same school in South Africa as the Grade 6s, because in the previous curriculum that South Africa used, the differentiation only came about in Grade 8. In the CAPS curriculum, a new phase starts in Grade 7. It would be problematic for Grade 7 to be physically moved to a new school. Thus, the difficulty in Mathematics occurs when learners reach Grade 7. The study focused on learners who reach Grade 7 in the same school in South Africa as the Grade 6 learners, because in the previous curriculum that South Africa used, the differentiation only came about in Grade 8. In the CAPS curriculum, a new phase starts in Grade 7. It would be problematic for a Grade 7 learner to be physically moved to a new school. Thus, the difficulty in Mathematics occurs when learners reach Grade 7. The study seeks to explore the most imposing factors that influence Grade 7 learners' performance in Mathematics at the Senior Phase. Furthermore, the study aims to explore the best teaching strategies for mathematical concepts thereby enhancing the performance of learners. The study also aims to help parents guide learners in choosing the most beneficial methods of achieving their goals in Mathematics. The objectives of the study were to explore the reasons why learners' marks tend to be lower when they reach Grade 7, and identifying the challenges that militate against learners' academic performance. Considering the above will allow teachers to adopt the best strategies to mitigate the challenge of marks decreasing. Six teachers, who were the participants for this study, were purposively chosen from the six schools selected for the study. Also selected for this study were six focus groups of four learners each. The qualitative research approach located within the contours of the interpretivist paradigm were chosen for this study. The case study design was used as the research design. Semi-structured interviews were conducted with the teachers and focus group discussions were held with the learners during the data collection process. Data were organised into categories and analysed using thematic analysis, which uses themes. Bronfenbrenner's Ecological Systems Theory formed the theoretical framework underpinning this study. This theory proposes that individuals develop in relation to environmental conditions, the time spent in the environment, and an individual's personal characteristics. The limitations of the study included the fact that the sample was small and drawn only from public schools in a predominantly rural province. The results of the study were that learners displayed

resilience in the face of the difficulties they experienced and the teachers ascertained that the learners recover quickly from the difficulties they may experience. However, the study found that although teachers are adequately trained and experienced in Mathematics, they need to enhance their curriculum delivery skills to include 21st century skills. This will ensure that learners remain focused and engaged during classes. Furthermore, the learners felt excluded by the outdated teaching pedagogies used by their teachers. One of the recommendations derived from the findings of the study is that teachers ought to adopt learner-centred teaching pedagogies that continue to keep learners engaged. Learners are exposed to modern digital technologies like television, computers and mobile phones, to which schools do not have adequate access. The study further recommends that teachers must modify their teaching approaches to learner-centred approaches that consider the use of digital technologies and thus respond appropriately to learners' interests. Teachers should teach learners time management skills to capacitate them to manage their time when undertaking their academic work. This study further suggests that schools should elicit the aid of social services to support learners in difficult socio-economic situations (SEEs).

CHAPTER 1: GENERAL INTRODUCTION

1.1 Introduction

This chapter presents a general introduction to the study. It discusses the background to the study, the problem statement, the rationale for the study, the research questions, and the aims and objectives of the study. It further presents an overview of the research methodology, the definition of keywords, an outlay of the chapters and finally the conclusion.

1.2 Background to the study

In South Africa, the Basic Education System starts from Grade R to Grade 12. This system was designed to support the education system to achieve the 21st century agenda where all citizens should have access to life-long learning and educational training. The system comprises different phases, which are; Foundation Phase (Grades R to 3), Intermediate Phase (Grades 4 to 6), Senior Phase (Grades 7 to 9), and Further Education and Training Phase (Grades 10 to 12) (South African Schools Act No. 84 of 1996). Learners who reach Grade 7 usually have their performance lose momentum due to several factors. According to Yao, Kong and Cai (2017), the issues that learners struggle with in a Grade 7 Mathematics classroom include, learner self-concept, learner engagement, learner motivation, the attitude of learners towards their homework and learner behaviour in the class. It is the responsibility of teachers to assist learners at this crucial stage of their schooling career (Coffey, 2013). A study conducted in South Africa similarly brings to the fore, that it is necessary for parents or the caregivers of learners to have a good social relationship with schools, this has been a factor that was explored in this study too (Jimmyns & Meyer-Weitz, 2021). This study seeks to find out why the marks of the learners decline when they reach Grade 7, especially in Mathematics. The researcher will explore the psychological, social and academic factors that impede learners' performance. This study explored the

factors that influence the performance of Senior Phase learners, particularly Grade 7 learners in Mathematics, the experiences of Grade 7 learners in the Mathematics classroom, the challenges that Grade 7 learners encounter in the Mathematics classroom and finally the strategies that teachers can use to eliminate the academic challenges experienced by Grade 7 learners and thus enhance the performance of these learners. The study used the qualitative approach and the interpretivist paradigm to bring an awareness of the researcher's own opinion to the study. The study adopted the case study design to allow the researcher to effectively delve into the actual phenomenon under study. The study was conducted in six schools in the Frances Baard District of the Northern Cape Province in South Africa. The sample comprised six teachers and participants six groups of four learner participants in each group. The purposive sampling technique of choosing participants was used, and the main criteria for the chosen participants was that they needed to have at least five years teaching experience in Mathematics. Data were collected using semi-structured interviews conducted with the teachers and focus-group discussions held with the learners. Data were analysed using thematic analysis. The factors that affect the performance of learners are divided into three categories. The categories are as follows: the psychological factors- resilience, enthusiasm, disengaged learners, anxiety, behaviour, confidence. The second set of factors are social factors, which include social factors in school, at home and in the wider community. The third set of factors affecting learners are academic factors which are, comprehension of concepts, mathematical learning difficulties, teaching of Mathematics in the second language of the learners. Some of the experiences that learners encountered in the mathematics classroom included, enthusiasm of learners towards mathematics, motivation, peer-assisted learning, and positive socio-economic situations. The challenges that learners experience in the Mathematics classroom are peer disruptions, time management in the Mathematics classroom, negative relationship between learners and their teachers. There were schools that experienced shortages of appropriate learning resources. Included are negative socio-economic situations of learners.

Continued factors are the strategies that can be used by Mathematics teachers to overcome the academic challenges experienced by learners in the mathematics classroom in Grade 7. They include using extra classes, using the services of a Maths coach, using more electronic technology in the classroom and the last factor that is explored is the adoption of learner-centred teaching methods. The factors explored above give an opening to the researcher to find the objectives of what strategies work best and which ones need to be adapted. The results of the study show that learners were disengaged during classroom activities and some of the learners had behaviour issues and low socio-economic situations that affected them. The recommendations developed from this study include the notion that teachers need to modify and upgrade their teaching strategies. Learner-centred teaching strategies should be implemented to stimulate learner engagement as well as eliminate the behavioural issues they are experiencing. The Department of Social Services ought to help parents who are struggling with social issues. Adapting to computer technology will be an added advantage. The limitations of the study are that it was done in a rural province and the sample was also relatively small, thus preventing the findings from being generalised.

1.3 Problem statement

Learners that reach Grade 7 would have reached a critical point in their schooling career. The following scenario helps to illuminate the problem of the study: As a Mathematics educator in the Intermediate and Senior Phase, the researcher often teaches Grade 7 learners who experience a decline in their academic performance. For this reason, this study explored the reasons why learners experience this decline in performance in Mathematics. This is a tedious time for the learners as they are seniors in their schools specifically in South Africa, however new to the academic phase. Some researchers opine that this problem arises from limited interaction between teachers and learners and Mathematics learners prefer isolating themselves

than asking for help (Attard, 2012). In a South African study conducted in Limpopo Province, it was found that learners who had a sound relationship with their parents had a significantly better schooling experience (Letsoalo, 2017). In Grade 7, learners would also have reached a different level of development. The study explores the experiences and challenges that learners encountered in the Grade 7 Mathematics classroom. The study further explores the intervention strategies that teachers can use to enhance the performance of Grade 7 Mathematics learners. The learners experienced enthusiasm, comprehension, motivation, and peer-assisted learning; however, they experienced challenges that included disruptive behaviour, anxiety, time-related constraints and negative socio-economic situations. A distinct disillusion occurs in Grade 7 because learners feel out of their depth, as they find it difficult to understand the concepts being introduced in Grade 7. The outcomes of this study will inform schools on how to modify the curriculum to benefit learners. It also encourages teachers to use the teaching strategies that are appropriate and best suited to the learners' needs. The results of the study show that learners feel disengaged in class; hence, there is a need for schools to upgrade their resources into more technologically advanced manipulatives. The teaching strategies have to be more learner-centred for them to accommodate the 21st century learner. In tandem with the research questions this section follows; the research questions which ask what the factors are that influence Grade 7 learners' performance in Mathematics in Grade 7. Added to this is the question of exploring the experiences of Grade 7 learners in the mathematics classroom. The study will highlight the challenges that learners experience with regard to their performance in Grade 7 Mathematics. Furthermore, the study elucidates the strategies that can be used to eliminate the difficulties that learners experience in the Mathematics classroom.

1.4 Rationale for the study

This study explores the factors that affect the performance of Grade7 learners in the Mathematics classroom, and it fills in the knowledge gap through exploring the reason for the decline in learners' performance in Mathematics. The study explores psychological, social and academic reasons for this decline. It further explores the challenges and experiences of learners and recommends the best strategies teachers may adopt to eliminate the psychological, social and academic challenges. The study has also found the appropriate strategies to be adopted by teachers, schools and parents in order to overcome these challenges. The study attempts to find gaps in the body of knowledge and the reasons will be explored from the perspective of both learners teachers. The psychological, social as well as the academic factors will be explored. Considering the findings of the study, recommendations are made according to the relevant factors.

1.5 Research questions

The main research question is:

What are the factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase?

The sub-research questions are as follows:

1. What are the experiences of Grade 7 learners in Mathematics in relation to the downward trend discernible in their results when they reach the Senior Phase?
2. What are the challenges that Grade 7 learners encounter in Mathematics?
3. What strategies can be devised by Mathematics teachers to overcome the academic challenges experienced by learners at the Senior Phase?

1.6 Aim of the study

1. The study seeks to explore the most imposing factors that influence Grade 7 learners' performance in Mathematics at the Senior Phase.
2. To assist educators in choosing the best strategies for teaching Mathematics concepts and thereby enhancing the performance of learners.
3. To help parents guide learners in choosing the most beneficial methods of achieving their goals in Mathematics.

1.7 Objectives of the study

1. To explore the experiences of Grade 7 learners in Mathematics in relation to the downward trend discernible in their results when they reach the Senior Phase;
2. To establish the challenges that learners encounter in Mathematics as possible causes for the loss in momentum at this crucial level;
3. To determine the strategies that educators may use to mitigate challenges in teaching Mathematics and improving the performance of Grade 7 learners.

1.8 Overview of research methodology

This study used a qualitative methodology encapsulated in an interpretivist paradigm. This allowed the researcher to enunciate the opinions of the participants as opposed to the opinion of the researcher. The research adopted a case study design and was conducted in six schools in the Frances Baard District in the Northern Cape Province, South Africa. Data were collected using semi-structured interviews conducted with teachers and focus group discussions held with learners. Six teachers and six groups of four learners each participated in the study. A total of thirty participants participated in the study. Purposive sampling was used to select the teachers who in turn chose the learners. The inclusion criteria for the teachers were that they had to be

Mathematics teachers and the learners were all doing Grade 7. The interviews were recorded electronically to ensure that all the information was captured. The recordings were transcribed soon after the conclusion of the interviews to ensure that all the relevant information was captured and gaps could be noted, which the researcher filled in subsequent interviews. This enhanced the credibility of the data. Permission to conduct the study was sought from the University of Free State and the Northern Cape Department of Education. The parents of all the learners who participated in the study granted permission for them to participate. They signed a consent form. Individual learners provided assent. All the participants were given information on the study and were also made aware of their right to withdraw their participation at any time and they were under no obligation.

1.9 Definition of keywords

- (i) **Grade 7 learners:** These are learners enrolled in a public school for their 8th year of schooling. In South Africa, they are in the first year of the Senior Phase and this is the first year of high school. They are still based in the primary school because in previous years, Grade 7 was the last year of primary school. However, they physically move to the high school in Grade 8 as stipulated in the *South African Schools Act* (Act No 84 of 1996).
- (ii) **Psychological factors:** Psychology refers to the personal and mental functioning of an individual across a lifespan. This study explores the psychological factors that constitute learners' behavioural aspects. It focuses on the emotional, social and educational developmental and make-up of the individual (Van den Bos, 2013).
- (iii) **Social factors:** These refer to the way people live and interact with their everyday environments (Gifford & Nilsson, 2014). In the context of this study, social issues refer to the issues around the relationships that the individual learner has encountered within their home, school and

community. The issues that affect their learning will be considered and explored.

- (iv) **Academic factors:** The learning processes of an individual are called on in learning (Donnelly, 2008). In the context of this study, academic factors refer to the way a learner learns and interacts with mathematical content and material in a Mathematics classroom. The factors being explored in this study are academic in nature.
- (v) **Time management:** This refers to the best uses of time in order to maximise learning (Zafarullah, Mumtaz, Murad, Abida, & Humera, 2016). The study found that one of the factors that impeded the learning process was the mismanagement of learners' time.
- (vi) **Socio-economic situation:** This is a measure of an individual's occupation and standing in a society (Oakes & Rossi, 2003). The socio-economic situation (SES) of learners was a factor that was explored by the study to see how it affects learner performance.
- (vii) **Learner-centred teaching:** This is a teaching strategy that takes into account the needs of the learners and not what is convenient to the teacher. If teachers create learning opportunities for learners, that gives them the reality of learners' life and not that of the teacher (Edelen, Bush, Abassian, Cook & Simpson, 2020). If a learner dislikes being in a classroom, then they should be allowed to learn in the way in which they are comfortable.

1.10 Outline of the dissertation

Chapter 1: The chapter presents the general introduction and background to the study. It outlines the problem statement, the rationale for the study, the research questions, the aims and the objectives of the study, an overview of the research methodology, the layout of the study and the conclusion of the chapter.

Chapter 2: This chapter illustrates the literature review, starting with the theoretical framework and delineates all the principles of the theory. It discusses the relevance of the theory to this study. It presents the relevant literature, outlining the theories emerging from the data collection and analysis.

Chapter 3: The chapter presents the methodology. It describes the research design, approach and paradigm. The demographics of participants and the research sites are illustrated in this chapter. The study population, sampling technique and the sample sizes are also described in this chapter.

Chapter 4: This chapter describes the collected data and the data analysis system used in the study. It further describes the thematic analysis technique, which was used during the data analysis process.

Chapter 5: The chapter presents the discussion of the findings; it proffers recommendations and reflections of the study.

1.11 Conclusion

This chapter has presented the general introduction to the study and a brief overview of the preoccupations of the study. It presented the background to the study, which is an exploration of the factors that influence the performance of Grade 7 learners in the Mathematics classroom. This was followed by the statement of the problem and thereafter, the rationale for the study was also illustrated. The chapter also outlined the research questions that guided the study, and this was followed by a presentation of the aims and objectives of the study. It described the research methodology underpinning this study; the sample sizes and the research sites were also illustrated in this study. The chapter rounded up by presenting the layout of the dissertation and the final the conclusion drawn from the study.

CHAPTER 2: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Introduction

The previous chapter introduced the background to this study and gave a brief overview of the factors that affect learners' performance in Mathematics; it also outlined the strategies that teachers can employ to overcome this phenomenon. The problem statement of the study and the research questions that was used to guide the study. The aims and objectives of the study was also illustrated.

This chapter reviews the literature related to the factors that influence the performance of Grade 7 learners in Mathematics in Frances Baard District, the experiences of Grade 7 learners in the Mathematics classroom, the challenges experienced by Grade 7 learners and the strategies that teachers can apply to eliminate the challenges learners are experiencing.

Vithal and Jansen (2012) define a literature review as an overview of current and previous research that is relevant to the topic under study. It involves an in-depth reading of the topic one is researching on (Winchester & Salji, 2016). According to Arshed and Danson (2015), the literature review section is a vital extraction and synthesis of the main ideas, points, issues and findings emerging from a review of a body of literature. By presenting a comprehensive literature review, the researcher will be able to understand the psycho-social factors influencing the performance of Grade 7 learners in Mathematics in Frances Baard District; thus, enabling the researcher to determine the strategies that teachers can implement to eliminate the negative factors. It also enables the researcher to identify the knowledge gaps and to recommend areas for further study.

The chapter initially focuses on the theoretical framework underpinning the study. This informs the methodology and data analysis method employed in this study.

Furthermore, this theory places the individual in a series of microsystems, which are the different environments in which individuals find themselves and in the light of this study, these environments are the home, school, and society, and lastly the country in which they find themselves. The way in which an individual develops and makes decisions entirely depends on the circumstances he or she undergoes within these environments. In this way, the individual interacts and develops relationships with different other individuals that are resident in these environments. The teachers, the individual learner's peers as well as his parents and the different relationships they enter into with other people in the community have an effect on the individual. The learner's mathematical development also depends on the circumstances that prevail in his/her Mathematics classroom.

In addition, related empirical studies on psycho-social factors influencing Grade 7 learners' performance in Mathematics will be reviewed and these will be discussed in relation to what global and local researchers have established regarding the phenomenon under study. By so doing, the researcher will be able to identify the gaps that the study seeks to address.

The objectives of the study will be addressed, which are; to explore the factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase and to establish the challenges that the learners undergo. Within the context of these findings, the researcher will address the strategies teachers may adopt in overcoming the challenges being experienced by the learner, and these challenges are corroborated by the teachers as both the teachers and the learners were interviewed.

Precisely, this chapter discusses the theoretical framework underpinning this study, which is Bronfenbrenner's (1975-2006) Ecological Systems Theory. This theory

proposes that an individual learner develops according to the different environments in which they grow up. This chapter also seeks to illustrate the literature that has been reviewed globally and locally from the different themes that emerged from the data.

The factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase fall into three categories. These include psychological factors, which include learner resilience, learner enthusiasm as displayed in the classroom, disengaged learners, learner anxiety, behaviour of learners in the classroom and learner confidence. The social factors that influence Grade 7 learners' performance in Mathematics are peer relationships and teacher-learner relationships; the second social factor includes family issues and the third is community issues.

The last category of psychological factors includes academic factors, which are the comprehension of concepts, mathematical learning difficulties and teaching Mathematics in the learners' second language.

The second research question allows the researcher to explore the experiences of Grade 7 learners in the Mathematics classroom and these are; the enthusiasm of learners in the mathematics classroom, learners' comprehension of concepts, and the motivation that learners acquire in the Mathematics classroom. Furthermore, this chapter also discusses the reviewed literature on peer-assisted learning, positive learner-teacher relationships and positive socio-economic environments. The third research question allows the researcher to explore the challenges that Grade 7 learners encounter in Mathematics. These challenges are; anxiety that is encountered by Grade 7 learners in the Mathematics classroom, peer disruptions, time management, negative learner-teacher relationships, shortage of learning resources, and a negative socio-economic environment.

The last question helps this study to explore the strategies that can be devised by Mathematics teachers to overcome academic challenges experienced by Grade 7

learners in the Senior Phase. These include the use of extra classes, employing the services of a Maths coach, adapting to electronic technology in the Mathematics classroom and learner-centred teaching.

The section below discusses the theoretical overview; it introduces and describes the theory that guides this study. Kivunja (2018) indicates that the theoretical framework is usually a vague topic, that is, it is often not clearly defined. Literature depicts a theory as a statement of interrelated concepts, definitions and propositions that explain ideas or situations within the limits of critical bonding assumptions that constitute deep, broad-based knowledge about the research topic (Kivunja, 2018; Glanz, 2017). Ridder (2017) identified a theory as components (concepts and constructs) used to identify the necessary elements of the phenomenon under investigation, thus explaining the underlying relationship(s) between them. This system is largely dependent on the amount of time an individual learner spends in a specific environment (Rosa & Tudge, 2013).

2.2 Theoretical framework

2.2.1 Introduction to the theoretical framework

This model was initiated and developed by a Russian-American psychologist, Urie Bronfenbrenner in 1979. It was refined throughout his life until 2006 (Hayes, O'Toole & Halpenny, 2007). The theory in circulation went through several phases since its inception in 1975 till the most recent phase in 2006. This study adopted the latest version of the theory, which maintains that an individual develops according to the PPCT model. This means that a *Person* undergoes a *Process*, a growth period within a specific environment and develops a depth of the relationships entered into with individual "caregivers" in this environment. The teachers, parents and peers may not be his caregivers, but this framework was initially used by healthcare professionals and thus it is also applicable to this study. The *Context* depends on the amount of

Time an individual spends in this environment. For instance, a learner spends a school day in the company of teachers and in the school environment and this has an effect on the learner's development. In the initial phases of this framework, Bronfenbrenner names the different zones or systems, the microsystem, the mesosystem, the exo-system and the macrosystem. These four systems are illustrated in the following sections along with their relevance to this study and their contribution to the development of the learners. The questions that learner participants were asked to answer emerged from the literature that the researcher read regarding the issue, thus the factors that emerged were derived from the questions that were asked.

2.2.2 Background of the Ecological Systems Theory

The framework of this study is encapsulated in the Ecological Systems Theory (EST) of development, which quests for an understanding of how Grade 7 learners develop and why their marks decline at this point in their schooling career. Bronfenbrenner contends that researchers do not always consider all the factors that affect the developing individual (Hayes, O'Toole & Halpenny, 2017).

All the different environments interact with each other to create a particular environment for the individual (Ettetal & Mahoney, 2017). The individual interacts and develops in these environments and this influences the individual's personality. These different environments constitute what are called microsystems. The time and place that an individual finds themselves in has an effect on their development (Hayes, O'Toole & Halpenny, 2007). In the context of this study, the learner's environment brings a different understanding of mathematical concepts and it also affects his relationships with his teachers, peers and parents (Edelen, Bush, Abassian, Cook & Simpson, 2020).

Considering the lens through which the learner looks at their position in the rest of the class, this will either enhance or disadvantage the learners' performance in the

Mathematics class. When the learner experiences the different factors, they either become resilient through the experience or lose their purpose in the Grade 7 Mathematics classroom. This study intends to establish the factors that influence the learners' performance.

2.2.3 The *Process-Person-Context-Time* model of the Ecological Theory

This Ecological Theory metamorphosed into the Ecological Systems Theory (EST) of development (Rosa & Tudge, 2013). In the definition of the ecology of human development, it involves an in-depth analysis of continual and mutual growth of an individual, with effects from an immediate setting, considering the context in which this setting is placed (Bronfenbrenner 1979:21 in Rosa & Tudge 2013:246).

The EST as a theory considers the effect the environment has on an individual their personal characteristics. The characteristics of an individual constitute an intrinsic attribute; thus, the environment affects individuals differently. To gain a holistic understanding of the performance of the learner, as this is relevant in this study, it is not only important to consider the learner, but also the environments in which that learner finds themselves (Rosa & Tudge, 2013).

The objectives of the theory are based on the proximal processes, person, context, and time (PPCT). This implies that learners come to the study with their own academic, psychological and emotional issues that are related to their context. The proximal processes include the environment the learner comes into, and how his or her relationships develop in these environments. The learners in the South African context appear to have a very different outlook, compared to their counterparts in Switzerland, where the climate and culture are different. The last component of the PPCT model is the time a learner spends in these environments; two years ago, learners were in classes of 40 learners in South Africa, and with the advent of the COVID-19 pandemic,

learners attend school in smaller groups every alternate day, which means that they spend half of the time at school and the relationships they develop are also affected.

2.3 Context of this study

The relationship a learner has with his/her teachers and with his peers in this study will be relevant in shedding light on the factors that influence his progression or retrogression in Mathematics (Rosa & Tudge, 2013). This relates to the thoughts and actions of a learner with regard to Mathematics; thus, the learner's relationship with symbols and issues relating to Mathematics is also relevant in this process (Rosa & Tudge, 2013). Proximal processes are a phenomenon that can be described as a process that happens to a person while they are interacting with their environment, over a period of time (Mercon-Vargas, Lima, Rosa & Tudge, 2020). The classroom environment, the school environment, the relationships with the different stakeholders, and the time that the learner spends in school all have the potential to affect the learner emotionally, socially and academically. During the interviews with teachers, it emerged that five out of six participants mentioned that there was little to no parental involvement in the Mathematics class. This has had an effect on the results of this study. The Ecological Engagement Methodology (EEM) was adapted from the PPCT model of the Bioecological Theory, which formed a framework that can be used to incorporate the objectives of this study into the theory (Koller, Raffaelli, & de Moraes, 2020). The main objective of EEM is to fuse EST into a research methodology (Koller et al., 2020). A key component of EEM is that all members of the research team keep a record of all the interactions with participants.

2.4 Principles of EST

This theory is based on four interrelated types of environmental systems. One can envisage a set of matryoshka dolls and how they all fit into each in the enhancement of each other (Ettetal & Mahoney, 2017). These four systems are:

- **Microsystem:** This is the immediate environment of the learner, for example the classroom.
- **Mesosystem:** This includes relationships that occur between the microsystems, for instance, the parent-teacher relationship.
- **Exosystem:** This is a microsystem, which affects the individual, but he is not directly involved in, for instance, occupational dynamics of the parents.
- **Chronosystem:** These are societal community elements surrounding the child, the geographical suburb of the learner in relation to his home.

2.4.1 Microsystem

This is the first environment that affects the development of the child. The Mathematics classroom and the place in which the learner lives are examples of his immediate environments (Ettedal & Mahoney, 2017:3). The relationships the child has with the relevant people in this environment also form part of the microsystem, and parent-learner and teacher-learner relationships are two examples of these relationships (Edelan et al., 2015). If the child resides in a hostel or foster home, then the house where he lives forms the microsystem that directly affects his or her personality. The development of the child in the Mathematics classroom will be linked to the environment where the child will be. According to Edelen et al. (2015), considering the extra-mural classes the learner attends have an effect on his development, for example, if he was part of a sports team or a cultural club like dance or music.

In this study, the immediate environment is the microsystem of the specific learner in the Mathematics classroom at the schools the research was conducted. It is also the relationship that the learners have built up with their Mathematics teacher in this class. Four out of six groups of Grade 7 learners mentioned that they had a good relationship with their teacher. The other two groups that said that they had no social relationship

with their educator indicated that if they did have a relationship with their Mathematics teacher, it would have an effect on their performance. Family (parents, guardians and teachers) can assist in raising Grade 7 learners' performance in Mathematics. The Mathematics classroom is a place where the child finds himself in this study. The researcher facilitated discussions with the learners in order to get a feel of what they experience in their Mathematics classroom. If the child resides in a home where learning and teaching is common, then it will be easier for that child to learn and absorb what they are taught; however, if he is constantly in an environment that is averse to learning and teaching, then this will inevitably affect how the learner perceives educational spheres.

2.4.2 Mesosystem

The way the different systemic levels interact with each other affects the development of the child. Occurrences in one system inevitably affect the child's development (Ettekal & Mahoney, 2017). The mesosystem is defined as the situational interactions that the different learners experience in their environment. The mesosystem and microsystem are very much alike in nature; however, instead of the interactions occurring within a single setting, it occurs across different settings (Rosa & Tudge, 2013). In this study, the mesosystem of a particular learner is the CAPS (Curriculum and Assessment Policy Statement) curriculum, which is taught in the Frances Baard District where this study was conducted. If the learner has access to the digital technology and the internet, this mesosystem will influence the individuals' performance in Mathematics (Rosa & Tudge, 2013). Mesosystem can be described as comprising two or more microsystems working in conjunction with each other.

2.4.3 Exosystem

The next significant system is the exosystem, which indirectly affects the learner, even though he or she is not directly in this system (Ettekal & Mahoney, 2017). This system

is not always clearly defined; rather, it is a covert system, though it still has an effect on learners' development. Learners do not actively participate in this system; however, they are affected by the environment surrounding this system (Rosa & Tudge, 2013). The decisions made in school governing body meetings affect the learners in as far as their schooling is concerned, in spite of not being directly involved in these decisions. There are also times when the learner can be the one who influences the decisions made in this system (Rosa & Tudge, 2013). For example, disciplinary hearing decisions are usually made with the learner at the forefront. The teacher's attitude towards the subject can influence or assist Grade 7 learners' performance in Mathematics at a school, and this is another part of the exosystem.

This study was done in a public school; thus, the functioning of the school was largely determined by the policies developed by the Department of Basic Education.

2.4.3 Macrosystem

The last system is the all-encompassing net, which inevitably affects all the other microsystems, and ultimately the entire development of an individual (Ettedal & Mahoney, 2017). The macrosystem has largely been defined as cultural influences that impact on a child (Edelen et al., 2015). It is a very abstract interactive system and rather benign as it may be affective among certain groups and not distinct among learners coming from different geographical locations (Edelen et al., 2015). Since this system is apparently abstract, it is rather daunting to apply it to the development of the learner. Examining learners from similar social backgrounds, it emerges that their development and interactions are similar; thus, the assumption is that this has an effect on the psychology of the learner (Rosa & Tudge, 2013). The culture and government of a society also determine the functioning of the learner's different environments (Rosa & Tudge, 2013). The geographical location of a school affects Grade 7 learners' performance in Mathematics at school. A quintile is the economic standing, location, and number of learners in the school, which can influence and

assist Grade 7 learners' performance in Mathematics at school. This also develops insight into strategies that work the best in the interest of the child.

In this study, learners coming from a lower socio-economic background are disadvantaged as they hail from under-resourced and lower socio-economic schools and homes. For instance, the school may not have electricity. One of the schools in the district does not have electricity in the classrooms except in the administration and cooking areas. The researcher avers that the learner participants' state of mathematical understanding ought to be considered before and after the pandemic. The teachers are sensitised to the situation and all the factors were considered.

2.4.4 Chronosystem

This is an additional system and a more recent and updated version of the bioecological model. It involves the time that certain incidents occur in the life of a child, and these incidents have an effect on the learner in the Mathematics classroom (Rosa & Tudge, 2013). In this study, it has been recorded as whether the learner has spent enough time in the different grades, before reaching Grade 7 and whether the learner is in the correct grade according to his development. One other aspect that should be considered in as far as the development of the child is concerned is his biological maturity and the nature of his relationship with the different people in this system.

LITERATURE REVIEW

2.4.5 The factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase

(i) Psychological factors

Psychological factors include learner resilience, learner enthusiasm, disengaged learners, learner anxiety, learner's behaviour in the classroom and learner confidence.

(ii) Learner resilience

Two Indonesian studies illustrated resilience as being persistent in a precarious situation and surviving with strength (Hutauruk & Priatna, 2017; Hafiz, Darhim & Dahlan, 2017). This study has explored resilience as a factor that influences the performance of learners. A balance is needed for the creation and maintenance of resilience as proposed in a Chinese study that found the need for establishing some positive environments for the individual learner to thrive (Chen & Padilla, 2019). A study conducted in South Africa stated that for teachers to foster the resilience of South African children, it is necessary for them to recognise the social environment of the learners (van Breda & Theron, 2017). Similarly, a study conducted in KwaZulu-Natal in South Africa alerts us to the issue of learner resilience in the classroom, which is associated with the support that learners receive at home from their caregivers (Jimmyns & Meyer-Weitz, 2021). The teachers in this study expressed satisfaction with the learners' demonstration of resilience despite the COVID-19 pandemic, which they have experienced. The resilience that learners demonstrated depended on their environments, as illustrated in the context of EST, which has been used for this study, which means that learners are capable of developing resilience within the systems in which they find themselves.

2.5 Learner enthusiasm displayed in the classroom

Enthusiasm is the learners' mind-set or subjective well-being (SWB), which they adopt and come to school with (Yao, Kong & Cai, 2017). SWB has been defined as a learner's mental state when he is working in the classroom. The SWB of learners is a factor that determines their performance as stated in a study conducted in Shanghai (Yao, Kong & Cai, 2017). Another study conducted in Australia supports this finding

by reiterating the notion that learners who have enthusiasm generally put more effort into their work, which enhances their performance (Velayutham & Aldridge, 2013). Another a study conducted in Croatia has stated that by using the term “adaptation”, which is defined as a child’s ability to connect with his or her environment, and “adjustment”, which refers to his performance within that environment, thus a combination of adaptation and adjustment certainly reflects the enthusiasm the learner displays in the class (Velan & Vorkapi, 2020). In the last decade, there has been a growing initiative to reform the pedagogies adopted in African schools, this has especially worked in Uganda and it has enhanced the education of African learners on the whole (Altinyelken, 2010). From the perspective of the EST that guides this study, the development of enthusiasm is largely dependent on the learner in the environment; thus, learners who have navigated their learning with enthusiasm will be better able to develop and grow.

(i) Disengaged learners

Higher learner engagement results in higher achievement and this is directly proportionate to educator attitude towards learners (Engels, Pakarinen, Lerkkanen, & Verschueren, 2019). A study conducted in America confirms that disengagement stems from a learner’s emotional detachment (Pyne, 2019). According to a study done in the United Kingdom by Symonds and Hargreaves (2014) on learner engagement in performance, two issues are highlighted; one is the learner’s “emotional engagement”, which is the level of enthusiasm that a learner adopts when he interacts with the different elements at school. The second issue is the learner’s “motivational engagement” – that is, the value the learner attaches to the relationships he engages in at school with peers and the learners’ self-concept at school; these in turn affect the learner’s future decisions (Symonds & Hargreaves, 2014:55). An Australian study done in a Catholic school suggests that high school learners are less involved in their classes, thus accounting for the decline in their performance, and there is a distinct disillusion with schoolwork specifically in Mathematics (Deieso & Fraser, 2017). The

same study confirms that the schooling system plays a major role in the disengagement of learners. A book that describes teaching pedagogies in Kenya encourages teachers to adopt learner-centered approaches and move away from teacher-centred approaches (Tabulawa, 2013). This study explored this engagement from the perspective of the teachers. This study has stressed the importance of a social group in determining the learner's level of engagement in the class. According to the EST, which describes these attributes within the context of the microsystem, the schooling environment is one of the first microsystems that determines the development of the learner.

(ii) Learner anxiety

Anxiety is a feeling of panic associated with a specific situation like a test or certain subjects done by a learner (Luttenberger, Wimmer & Paechter, 2018). This study attributes anxiety to the learners and the feeling they undergo in the Mathematics classroom and how this affects their performance and development. A study conducted in the United Kingdom attributes decreased learner performance directly to anxiety (Evans, Gaysina & Field, 2020). A Kurdish study established that learners who fear failure go through anxiety (Anwar & Louise, 2020). **An African study has established that learners in the Sub-Saharan region suffer with addictions and this may be a leading cause of anxiety in schools (Vancamfort et al., 2020).** Another study conducted by Ramirez, Hooper, Kersting, Ferguson and Yeager (2018) on Maths anxiety of teachers indicated that anxiety can be reflected onto learners. With regards to the EST framework employed in this study, the relationship that learners have with their teachers enables them to overcome this anxiety. The nature of relationships that teachers build with their learners either promotes or contains anxiety. This study found the anxiety that learners experienced came from the preconceived idea that learners have about Mathematics; however, after the first term, when learners have adapted to the new environment, they feel fine and ready to adjust well with their teacher. Anxiety

plays an important role in the context and the “person” components of EST the researcher used to execute this study.

2.6 Behaviour of learners in the class

An Australian study found that learners’ behaviour is largely dependent on the teacher’s organisational skills; this is dependent on the environment created in the class (Durksen, Way, Bobis, Anderson & Skilling, 2017). According to a study conducted in Sri Lanka, it is imperative for teachers to control the behaviour of learners by differentiating their teaching methods to curb the unruly behaviour exhibited by learners (Abeygunawardena & Vithanapathirana, 2019). According to an African study conducted in Ethiopia it has been established that due to the class sizes the behaviour of learners tends to be more negative (Bati, Gelderblom & van Biljon, 2014). Wentzel and Miele (2016) described the teacher-learner relationship as being a major contributor to the behaviour of learners in the classroom. Learners will behave according to the classroom environment created by the teacher; this has been affirmed by Segumpan and Tan (2018) in a study conducted in the Phillipines. These factors are indicated in the theoretical framework that was used to navigate this study, as the EST helps to illustrate the development of an individual, according to the environment.

(i) Learner confidence

Learner confidence is largely an intrinsic factor that stems from the learner being attuned to his learning environment and learning content (Lawlor, Marshall & Tangney, 2016). The study referred to above was conducted in Ireland, and it associates learner confidence with the control that learners ought to exercise over their learning. This means that learning programmes and learning environments must be modified according to learners’ needs. A study conducted by Pampaka et al. (2018) on learner self-efficacy in the United Kingdom found that the confidence learners display is very much dependent on the strategies that teachers use to present the curriculum to their

learners in the Mathematics classroom. Learners who are confident in the learning method gain the skills they need in Mathematics; this directly impacts their performance. Literature has shown that different pedagogies used in the teaching of Mathematics enhance learner performance. For example, a study conducted in Indonesia proposes that learners who have the necessary mathematical problem-solving skill display confidence in the classroom (Surya, Putri & Mukhtar, 2017). Further, a study conducted in Kenya proposes that when learners are competent in an activity, this improves their confidence (Ouma, Toromo, Wanami, Kabesa & Mubichkani 2020). Drawing from the EST used in this study, it is evident that learners must be guided by teachers who can nurture learners, thus helping them to develop and grow according to their own measures.

(ii) Social factors

Social factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase are categorised into three types. The factors that affect learners in school, the factors that affect learners in the family, and the factors that affect learners in the community.

(a) In the school

The factors that affect learners in school are divided into two categories, learner-learner relationships and learner-teacher relationships.

(b) Peer relationships

This relationship comprises the relationships that learners have with each other and their friends. A study conducted in American proposes that peer relationships will benefit learners who have had unhappy relationships at home (Mishra, Christ, Schwab-Reese & Nair, 2021). Another study conducted in Australia proposes that there are both positive and negative benefits of peer relationships (Gowing, 2019). A study conducted in Uganda has reiterated the issue of learner well-being through

relationships, and as young girls may not have sound relationships, this may lead to the weak mental health of learners (Nabuny et al, 2020). The teachers who participated in this study mentioned that there are a few negative relationships among the girls in a specific school. Tying all this up to Bronfenbrenner's EST, the relationships that learners have within the first microsystem, is an important one as it enhances learner development, and this is called the mesosystem.

(c) Teacher-learner relationships

The next relationship which is significant in school is the teacher-learner relationship. The teachers in this study are equal in that some have a good relationship while others feel they are not the learner's friends. A study conducted in Amsterdam, concerning affective teacher-learner relationships confirmed the importance of teacher-learner relationship for older learners as well as learners from lower socio-economic status (Roorda, Koomen, Spilt & Oort, 2011). A study conducted in Italy has reiterated that a learner's SES impacts the relationships that are fostered with teachers and this same study has also shown that when a learner has a civil relationship with teachers, bullying is abated (Longobardi, Lotti, Jungert & Settanni, 2018). This is significant to this study as the learners from this study were from lower-medium SES's. **A South African study on the female teachers' relationships with their learners in South African rural schools found that as much as teachers would like to have a sound relationship with learners, this is rendered impossible due to overcrowded schools and inadequate teacher training (Sibiya, Gamede & Uleanya, 2019).** Like peer relationships, this relationship falls into the category of the mesosystem, which is the relationships that are developed by the individual in the different microsystems of the EST.

(d) Family issues

It is regrettable that the teachers in this study reported little to no parental involvement; the literature from abroad shows that in order for learners to succeed, it is imperative that teachers solicit parental involvement. A study conducted in the United Kingdom

has supported this notion, thus underscoring the view that learner performance improves proportionately with parental support (Goodall, 2018). A Taiwanese study further confirmed that parental support is necessary for learners' success along with other factors that affect learner performance (Shih & Chang, 2018). A study conducted in South Africa has found that a teacher's attitude to parents explains why they do not want to be involved with their children (Munje & Mncube 2018:88). The EST also confirms this issue of relationships within the microsystem, which connects with the mesosystem.

(e) Community issues

The main factor that affects learners in this study is their SES. This permeates into the school and affects the performance of Grade 7 learners. An Australian study conducted in Queensland suggests that there is substantial evidence that points in the direction of community background as being a factor in the school (Thompson, 2018). There is substantial evidence that points to the interrelation of learners' academic performance and their SES's. Learners are trying to survive and this hampers their learning. According to a study conducted in Mexico, regarding the transition of pre-school learners to primary school, learners from better SES have a better academic experience (Urbina-Garcia, 2018). A study conducted in Pakistan also supports the statement that the SES of learners plays a major role in influencing learners' performance (Farooq, Chaudhry, Shafiq & Berhau, 2010). Supporting this notion, a study in Rwanda proposes that under-resourced schools are a major crutch for learners in those schools (Milligan, Koornhof, Sapire & Tikly, 2019). A Mexican study that also employs the same EST, perpetuates the notion that learner development is dependent on the chronosystem, which is the broader community in which the child lives. South African learners are especially vulnerable to this issue, as a study done in the country's capital city, Pretoria, illustrates how children become the reason for their parent's involvement in unpleasant elements of society (Masilo, 2018). These parents will seek revenge on behalf of their children, thus perpetuating the violence

occurring in the community. This study uses the EST and it places an emphasis on the interrelatedness of the broader community and the developing learner.

(ii) Academic factors

Academic factors are the comprehension of concepts, mathematical learning difficulties, and teaching Mathematics in the learner's second language.

(a) Comprehension of concepts

A study conducted in the Philippines on the learner's performance can be attributed to solving of mathematical problems; learners found the comprehension of Mathematics to be a factor that hampers their performance (Peteros, Gamboa, Etcuban, Dinauanao, Sitoy, & Arcadio, 2019). **This is supported by a Ugandan study on the mathematical performance of learners, which stated that learners who have performed well in lower grades will maintain their momentum throughout Grade7 (Kiwauka, Van Damme, Noorgate, Anumendem & Namusisi, 2015).** An Indonesian study has stated that there are gender differences in understanding concepts, claiming that men understand more representation, while women understand more visual aspects of Mathematics (Alghadari, Herman & Prabawanto 2020). Optimal performance in Mathematics means that a learner has to understand representation; however, this is a developmental issue that impedes learners' performance in Grade 7 Mathematics. This is significant in South Africa, as a study conducted in the North-West Province, South Africa has emphasised that if learners do not understand the concepts, then it is necessary for educators to explore the use of different teaching strategies and also to explore their learners' learning styles (Bosman & Schulze, 2018).

(b) Mathematical learning difficulties

Mathematics is a scaffolded subject, meaning that new knowledge is built on what a learner already knows. This study has found that learners' foundation is firmly consolidated, thus the poor performance learners exhibit is not due to difficulties;

rather, it can be attributed to a foundation of learning that is not well consolidated. The foundation of Mathematics learning must be solid before more knowledge can be acquired. This is according to a Canadian study (Abrue-Mendoza, Chamaro, Garcia-Barrera & Matute, 2018). Accordingly, a study conducted in Kosovo, with regard to children with learning difficulties, learners who underperform in Mathematics are incapable of doing complex calculations, and this is due to developmental barriers and immature teaching strategies (Salihu & Rasanen, 2018). Teachers need to see the range of learners' learning abilities and update their teaching. Considering the theoretical framework underpinning this study, it becomes apparent that the development of learners is very much dependent on the environment (microsystem as well as the mesosystem, the school and the relationship with the teacher). Similarly, a study done in Ghana supports the notion that teacher training is vital for the success of a differentiated curriculum (Karr, Hayes & Hayford, 2020). A South African study concluded that the CAPS curriculum does not adequately provide for the needs of South African learners (Soares, 2020). All the schools in this study use the CAPS curriculum and contrary to the study above, the teachers in this study felt that it was sufficient for learners to perform optimally.

(c) Teaching Mathematics in the learners' second language

Learning Mathematics is a process, and so is language learning; however, both are frameworks which are created by exposure to that language (Bosse, Ringler, Bayaga, Fountain & Young, 2018). The study cited above attempted to create a new framework for mathematical learning through a second language, the deduction that was made is that adequate exposure needs to occur for optimal performance. An Iranian study that discusses the willingness of learners to communicate in a second language states that learners are not motivated enough when they are taught in a second language and this reduces the enjoyment of their Mathematics classes (Khajavy, Macintyre & Elyas, 2017). A study conducted in Massachusetts on a group of Haitian learners has found that the main reason that makes learners struggle in Mathematics is that they

do not have total command of the English language (Blaise, 2018). A study conducted in Germany has confirmed that in order for learners to gain conceptual understanding, it is necessary to accommodate the language of learning and teaching (Prediger & Zindel, 2017). A study conducted in South Africa notes that learners are disadvantaged because they experience insufficient learning opportunities in their home languages (Robertson & Graven, 2018). The study cited above makes a valid suggestion that teachers should use the lingo (manner of talking) of the learners when explaining concepts, which brings into light the context of the subject. The learners need to be taught in a style that is appropriate to their level of understanding and style. Considering all of the above in the light of the EST, one can deduce that the development of learners occurs in the context of the society.

(d) The experiences of Grade 7 learners in Mathematics in relation to their results when they reach the Senior Phase

This study interviewed selected learners and the following themes emerged: the enthusiasm of learners in the Mathematics classroom, the comprehension of concepts and the motivation of learners in the classroom. Furthermore, the factors that influence learners' performance included peer-assisted learning and learner-teacher relationships. Positive SES has been found to be the last factor that influences learners' performance.

2.6 Enthusiasm of learners in the Mathematics classroom

An overwhelming amount of literature reiterates that learner enthusiasm stems from teacher enthusiasm as the teacher sets the tone in the classroom. According to a study conducted in Germany, regarding teacher enthusiasm, the way that learners perceive their place in the class affects their enthusiasm, and this largely depends on the attitude of the teachers (Lazarides, Buchholz & Rubach, 2018). An Australian study conducted on learner enthusiasm mentioned that learners' understanding of mathematical concepts added to their enthusiasm in Mathematics (Russo & Russo,

2019). In Indonesia, a study noted that practical and physical methods (mathematical modelling) of learning added to learners' enthusiasm during a mathematical class (Riyanto, 2019). Interestingly, a South African study found that learners' enthusiasm was shaped by the need they had for Mathematics as a subject that influenced the development of their careers (Mokgwathi, Graham & Fraser, 2018). One learner commented in this study, "I have to do well in Mathematics as I would like to be a doctor". Learners in this study showed enthusiasm in Mathematics after they had understood the concepts. This is directly supported by the mesosystem of the EST used in this study to show how the relationships that learners adopt with the individuals in the microsystem.

2.6.1 Comprehension of concepts

Learners' understanding of concepts motivates them to do more. A study conducted in Pakistan regarding comprehension found that learners were motivated to learn when they had study material relevant to their cognitive level (Ali & Pathan, 2017). A study conducted in Taiwan found that using game-based learning on an electronic device considerably motivated learners, due to the ease of access to study material. There is a notion in this study too, that learners felt the need to upgrade learning material. A South African study found that learners need to be motivated by their educators as motivation is very much intrinsic (George & Adu, 2018). A Rwandan study supports the notion of ICT used in classes to increase the motivation of learners and the quality of education in the classroom (Munyebgabe, Yiyi, Haiyan & Hitimana 2017). The EST, which underpins this study, advocates the inclusion of the whole school and teachers in the development of the learners, in the microsystem (school) and the mesosystem (relationship with the teacher).

2.6.2 Motivation that learners feel in the Mathematics classroom

The motivation that learners experience comes from the value they place on an activity. Learners who know that they need Mathematics for future endeavours will be motivated to learn and perform better. An Indonesian study on learner motivation and achievement found that learner motivation is encouraged by internal and external factors; internal factors include fear of failure or passing, and external factors include teacher attitude (Ernita, Muin, Verawati & Prayogi, 2021). This study found that learners are motivated by the success they experience and the attitude of the teachers towards them when they do well. According to an American study on learner motivational frameworks, a learner's mindset is a determinant factor in the motivation of learners, if they have a "can-do" attitude, success follows them and if not, then the adverse happens (Gunderson, Park, Maloney, Beilock & Levine, 2018). In agreement with this, a study in Ghana concluded that teachers are at the helm of learner motivation and this is supported by teacher programmes run by stakeholders in the education sector (Akyeampong 2017). According to a South African study, the motivation of learners is dependent on the goals that learners adopt for themselves in their learning areas (Mupira & Ramnarain, 2018). Although South African schools have been previously disadvantaged, there is a need for learners to be encouraged in the field of Mathematics and Science subjects. This study has found that learners are motivated by success, thus the need remains in schools to develop interventions in this regard.

2.6.3 Peer-assisted learning – a positive experience for learners

According to a UK study conducted to investigate peer-assisted learning, it emerged that peer-assisted learning is a chosen option for learners, because they feel safe learning with their friends, thus giving them a sense of security (Tamachi, Giles, Doman & Hill, 2018). Another study conducted in America supports this notion, saying that peer-assisted learning should especially be aimed at vulnerable learners, like

minority racial groups and learners with disabilities (Thorius & Graff, 2018). A study conducted in Brunei has found positive outcomes for peer-assisted learners, which gives the learners a sense of belonging and this supports learner performance (Omar, Shahrill, Zuraifah & Sajali, 2018). When learners work together and give each other feedback, this enhances relationships and calls upon the EST used in this study, thus showing the importance of relationships formed in the microsystem. A study done in Brunei among medical students found that there is a parallel relationship that is formed with the learner and is equally vital to his or her development as a vertical relationship (Sammaraiiee, Mistry, Lim, Wittner, Deepak & Lim, 2016). In South Africa, a peer learning programme in higher learning has reportedly been beneficial to learners in terms of addressing the inefficiencies experienced and those positive effects of peer learning have been noted (Makala, 2017).

2.6.4 Positive learner-teacher relationships

The literature on learner-teacher relationships displays a positive relationship between this relationship and learner achievement and this has been confirmed by an American study (Amadi & Paul, 2017). Ample literature supports the proposal that teachers are the main catalysts in determining the environment created in the classroom. A New-Zealand-based study that describes the roles of teachers and learners in the education spheres, pronounces the importance of defining the roles of learners and teachers, which suggests a more integrated role between teachers and learners and giving learners a louder voice in the facilitation of teaching and learning (Robertson, 2017). A study conducted in Ghana supports this notion on the importance of social relationships in Schools (Ansong, Okumu, Bowen, & Walker, 2017). In South Africa, it has been established that teacher attitude is vital to learning and teaching and the teacher's ability to adapt and modify the teaching strategies that are accommodative of the learner (Arends, Winnaar & Mosimege, 2017). The EST clarifies that the

relationships that learners adopt with teachers are important for learner performance in the school setting.

2.6.4 Positive SES

A study conducted in China found that children who have a positive environment at home and a positive socio-economic status (SES) perform better as they have the necessary support structure for enhancement (Zhang, Zhou, Gu, Lei & Fan, 2018). A study conducted in the United Kingdom on the SES of learners and the food they eat, is significant in that it informs the study that learners from higher SES fair better than their counterparts from lower SES (Wills, Danesi, Kapetanaki & Hamilton, 2018). Another South African study established that learners who come from higher SES perform better because they have the necessary support at home, and learners from lower SES and parents are tired and so are children when they get home thus making it difficult for them to support their children (Ndebele, 2018). An Ethiopian study confirmed that a positive SES leads to good school governance and in turn this develops learners' outlook in the education sphere (Mitchell 2017:50). A look at the EST demonstrates that one important system in the growth of a child is the microsystem of the home of the child and the circumstances that he experiences there, and how this affects his performance.

2.7 The challenges that Grade 7 learners encounter in Mathematics

This section articulates the challenges that learners experience in their learning activities. These factors have been derived as themes that have emerged from learners' perspective. These factors include, anxiety experienced by learners, peer disruptions, and time constraints. The study further focuses on the misunderstanding of topics, negative learner-teacher relationships, shortage of learning resources and negative SES.

2.7.1 Anxiety experienced by Grade 7 learners in the mathematics classroom

Learners experience anxiety in Mathematics for a number of reasons; times tests and misunderstanding of topics are some of the reasons mentioned in this study. In a Dutch study, learners experienced some anxiety if they were failing to understand their work (Somers & Llinares, 2018). In a Philipino study, we learn the level of anxiety that learners feel towards mathematics will determine their performance and the two are related (Jole-jole-Caube, Dumlao & Abojeco, 2018). Math anxiety is related to mental health, and it is usually associated with negative learning situations. An Austrian study pointed to a few factors that can curb this factor, among others that have been mentioned in this study, the attitude of parents and teachers (Luttenberger, Wimmer & Paechter, 2018). A study conducted in Ethiopia has determined that Maths anxiety is experienced by under-performing learners, and the anxiety is caused by learners' inability to perform complex mathematical topics (Shishigu, 2018). A study in South Africa found that our learners struggled with anxiety related to tests (Van der Nest, Long & Engelbrecht, 2018). The learners in this study also confessed to struggling with timed tests as these often caused their failure. The situation within the classroom has a bearing on the development of the learner and the performance of the learner in the Mathematics classroom, according to the principals of EST.

2.7.1 Peer disruptions in the Mathematics classroom

Peer disruptions are caused by learners who do not abide by school rules and disrupt learning. A study conducted in Switzerland found several ways in which learners disrupt classes by talking excessively in order to remain popular among their friends (Muller, Hofman, Begert & Cillessen, 2018). Disruptive behaviour is associated with learner disengagement, as established in a study conducted in the United States of America (Calderella, Larsen, Williams, Wills & Wehby, 2019). A study conducted in the United Kingdom has placed disruptive behaviours at the helm of mental health issues, and thus indicates that educators are not trained in this field (Ogundele, 2018).

In South Africa, this is a huge problem that needs interventions from higher authorities, as teachers are unable to deal with this kind of disruptions especially in rural schools (Nunan, 2021). This kind of behaviour is directly related to the way in which learners are developed within the EST, which is the chosen framework for this study. The chronosystem (EST), which is the community that a learner comes from, is a system that molds the learner in this field.

2.7.2 Time management

Time management emerged as a theme in this study, learners do not have the skill to manage their time properly, which leads to work remaining incomplete and affecting performance. A study conducted in Pakistan found that deficient time management skills in the classroom environment affect the performance of learners (Zafarullah, Mumtaaz. Murad, Abida & Humera, 2016). A Nigerian study supports this notion that timed tests and time management skills are direct factors that affect learner performance (Ubaka, Sansgiry & Ukwe, 2015). A South African study done on students' time management skills confirms that learners lack time management skills and this affects their performance (Mukwevho, 2018). Another South African study found that time management is a problem for many rural schools and this impacts on learning activities (Waller & Maxwell, 2017). The researcher wishes to touch on the EST of this study, in iterating the importance of time, as one of the tenets of the theory. The relevance of an activity practiced for long enough and for a number of years will develop the individual to a better level.

2.7.3 Negative learner-teacher relationships

The teacher is the classroom manager; hence, the environment that lingers in the class depends on the attitude of the teacher. According to Wright (2017), as deduced from an English study, the relationship that exists between teachers and learners affects the performance of learners. It is evident from this study that teachers set the

tone in the classroom; it is also their responsibility to ensure that all learners are included in lessons as well as differentiated lessons to accommodate all levels of learners. When learners feel secure in their classrooms, they will learn optimally, and this enhances learner performance, and this has been confirmed by a Korean study (Joe, Hiver & Al-Hoorie, 2016). A study conducted in Nigeria established that teachers needed to discuss learner choices and performance with them; this facilitates the creation of a conducive atmosphere in the class and promotes good academic performance among learners (Amadi & Paul, 2017). In the South African context, it is sad to note that teachers play parental roles in schools and are unable to enforce discipline on learners (Segalo & Rambuda, 2018). A study conducted in Malaysia has apparently advocated the preparation of learners for the 21st century, which is necessary to equip them with critical thinking skills and this can only be done with learner-centered teaching and learning, thus giving learners the reigns to navigate their own learning (Taufik & Maat, 2016). The relationships that learners develop in the microsystem are referred to as learners' relationships with teachers.

2.7.4 Shortage of learning resources

Learning and teaching resources are necessary for effective teaching. According to a Tanzanian study, the lack of learning resources was a cause for learner under-performance (Sephania, Too & Kipng'etich, 2017). A study conducted in Pakistan emphasised that the shortage of learning resources is a problem in schools, especially training facilities (Farooq & Kai, 2018). South African schools have a minor problem when it comes to shortage of textbooks as has been confirmed by a study done on the Siyavula maths and science book that is available free of charge to the South African public (Lambert, 2019). The problem that South Africa has relates to the upgrading of what is already available and the motivation of teachers in this regard (Mzuza & Van Der Westhuizen, 2019). One solution that Fleisch and Dixon (2019) have mentioned in a South African study is that if teachers rearrange their classrooms, use more

contact time with learners and use more learning resources, they gain more confidence in the classroom, which will inevitably increase learner performance. From the perspective of the EST used in this study, it becomes evident that the context, which gives constitutes the surroundings of the learner, gives a clear description of the development of the learner in this field.

2.7.5 Negative socio-economic environment

A Canadian study found that a negative socio-economic status of younger learners has an effect on their development (Schibli, Wong, Hedayati & D'Anguili, 2017). In an Australian study, it was found that a learner's socio-economic status is an important part of learning and may even be more important than the academic deficiencies experienced by learners (Chakraborty & Harper, 2017). Although some of them can assist others, schools in Africa are not willing to share best practices and this makes it difficult for the struggling schools to prosper. This emerged in a study done in three African countries, Kenya, Uganda and South Africa (Ngimwa & Wilson 2012). The SES of learners suggest that the effects of apartheid still linger in South African schools and have a lifelong effect on learners (Khumalo & Alhassan, 2020). Learners in this study received food from the school; however, there are other social issues they struggle with, like overcrowded homes and absent guardians. The EST of Bronfenbrenner confirms that the microsystems affect learners, and this is evident from the microsystem of the home and the geographical location of the school.

2.8 What strategies that can be devised by Mathematics teachers to overcome academic challenges experienced by learners at the Senior Phase?

This question was derived from the interviews conducted with teachers who have been teaching Grade 7 learners for a minimum of 5 years, and the suggestions here have been expressed by teachers. They have even suggested intervention strategies that may assist them eliminate the problems that the Grade 7 learners experience in the

Mathematics classroom. This section deals with the relevant literature that was found on using extra classes, employing the services of a math coach, using electronic technology in the Mathematics classroom. Furthermore, this section unpacks the literature on using concrete mathematical manipulatives to teach Mathematics and the consolidation of concepts.

2.8.1 Using extra classes

Extra classes are classified as an intervention strategy because the learner is removed from the conventional class and made to remain with the teacher. This assists the teacher to teach at the learner's pace. This is considered as differentiated learning, as the lesson goes at the pace of the learner and is a much-specialized instruction (Siddiqui & Alghamdi, 2017). **A study conducted in Uganda has confirmed that even though learners are in a school, there is no guarantee of learning because the teachers are not fully equipped to teach learners and this is a major hindrance to the education of learners (Bold et al., 2017).** The idea is the norm in South African schools, emphasizing the need for more differentiated learning and more learning time (Chirinda & Barnby, 2017). The teachers who participated in this study equally advocated for extra classes, and a more experienced teacher does not ask learners to come for extra classes, as they intervene in the class, till the learners understand the work and what is expected from them. The time a learner spends in the classroom and the nature of the relationships that a learner develops in the classroom, directly influences the development of the learner according to the EST used in this study.

2.8.2 Employing the services of a Maths coach

Many South African schools employ Maths coaches as an intervention strategy. These coaches are trained to assist learners grasp mathematical concepts; however, they have to liaise with the teacher regarding the learners' difficulties. In a Colombian study that involved Maths coaches, the assumption was that they are not adequately

qualified and would not be worth the effort (Harbour & Saclarides, 2020). In an American study, it was confirmed that coaches must be adequately trained in order to introduce the mathematical concepts to learners (Baker & Galanti, 2017). Another American study confirmed that math coaches enhance the performance of learners, as they act as “co-teachers”; this helps in the collaboration of the communities the learners come from as the math coaches are from the same communities as the learners (Hartman, 2017:18). A study conducted in Saudi Arabia confirms that the math coach plays a role in one-on-one teaching which is beneficial for performance (Siddiqui & Alghamdi, 2017). **In a study conducted in Uganda it has been established that these are merely complimentary to learners’ education (Conn 2017).** Referring to EST, which underpinned this study, the relationships that learners develop with these coaches can have lasting effects on their learning. If learners are consistent in their attendance of extra classes and for the specified period of time, this will mean a significant change in performance of learners.

2.8.3 Upgrade to electronic technology in the Mathematics classroom

In recent years there has been a change in the way the world operates and more people have adopted the use of technology. Teachers in this study felt that it would be good for the schools to upgrade to electronic resources; however, the realization is there that this is expensive and requires training for the teachers that are already in the system. A study conducted in the United Kingdom advocates for the use of electronic mathematical manipulatives in the teaching of mathematical topics like fractions and geometry (Ahmed, Clarke-Jeavons & Oldknow, 2004). A study conducted in Iran especially emphasized the use of audio and visual teaching aids to enhance the performance of learners in an attempt to keep them engaged in the class. This study found a 60% increase in learner engagement (Alshatri, Wakil, Jamal & Bakhtyar, 2019). African countries may have the capacity to migrate to electronic mediums of teaching, however, they still have network problems, and this is a major

disadvantage (Harris, 2020). A study conducted in Malaysia stated that the deficiency in learners' ability to engage in higher order thinking is due to lack of physical mathematical resources such as a mathematics lab and the Internet (Alhassora, Abu & Abdullah, 2017). The use of technology in South Africa is "routine" and not as it should be, "transformational, means that it will change the face of teaching by giving the teaching and learning to the learner, rather than just being an upgrade from the chalkboard. If the teachers are using the smartboard in place of a chalkboard, then we have a routine change and not a transformational change (Graham, Stols & Kapp, 2021). The use of technological manipulatives should be to create learner-centered teaching. The relationship that learners create with the environment is a significant one, especially when one considers the EST employed in this study.

2.8.4 Learner-centred teaching

The development and conceptual understanding of learners is significant in that learners need to be at a certain level for them to understand certain concepts. A study done in Nepal established, that among other issues, that it is necessary for teachers to be trained in the use of differentiated teaching to enhance the performance of learners (Panthi & Belbase, 2017). A study done in South Africa emphasised the playing of games that integrated the counting of physical objects, and this is part of teaching mathematical concepts using manipulatives (Kortjass, 2018:7). It has been documented in a Turkish study that learners who are allowed to self-regulate their own study methods will perform better than those who do not self-regulate (Ergen & Kanadli, 2017). A study in Eritrea advocates that learner-centered teaching is vitally important for the productivity of the country and this is often overlooked by education authorities (Posti-Ahokas, Merilainen & Westman, 2018). The EST points out that the learners will develop according to the environment they are placed in, and this is significant, considering the games the learners play and learner-centered teaching means that learners have some control over the skills they adopt. This is supported

by the study cited above, which investigated learner-centered teaching and found that learners perform better when they are in control of their learning; hence, learners in this study felt that they are responsible for their own activities and loss of learning time.

2.9 Conclusion

This chapter has discussed the theoretical framework which will be used to shade the study. The theoretical framework used in this study is Bronfenbrenner's Ecological Systems Theory (EST). This theory proposes that learners develop according to the different environments they are exposed to during their growth period; these environments, along with the relationships they have and the time spent in these environments, all play a role in the development of the learner. Thereafter, the researcher discussed the factors that emerged according to the themes developed from the data analysis. These themes are the factors that influence the performance of Grade 7 learners in Mathematics in the Senior Phase. The factors are divided into three groups; that is, psychological factors, social factors and academic factors. The psychological factors include learner resilience, learner enthusiasm, disengaged learners, learner anxiety, behaviour of learners in the class and learner confidence. Social factors are school issues, which entail peer relationships and teacher-learner relationships, as well as family and community issues. Academic factors include the comprehension of concepts, mathematical learning difficulties and teaching Mathematics in the learners' second language. The second objective that guided the study was the experiences of Grade 7 learners in Mathematics in the Senior Phase; and these are the enthusiasm of learners in the classroom, comprehension of concepts, the motivation learners feel in the Mathematics classroom, peer-assisted learning, positive learner-teacher relationships and a positive socio-economic environment. The third objective of the study was the challenges encountered by Grade 7 learners in the Mathematics classroom; these challenges are anxiety experienced by learners in the classroom, peer disruptions, mismanagement of time,

misunderstanding of topics, negative learner-teacher relationships, shortage of learning resources and negative socio-economic situations. The fourth objective borders on the strategies that can be used to overcome academic challenges experienced by learners in the Grade 7 Mathematics classroom and these are extra classes, employing the services of a math coach, upgrading to electronic technology in the Mathematics classroom and learner-centred teaching.

CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN

3.1 Introduction

This chapter presents the study's research methodology and design. It describes the qualitative research approach encapsulated in the interpretivism paradigm and the case study research design underpinning the study. The research site and data collection methods are discussed in this chapter. Furthermore, the chapter addresses data analysis, validity and trustworthiness, ethical considerations and the conclusion of the chapter.

3.2 Research approach

This study has employed a qualitative approach to explore factors that influence Grade 7 learners' performance in Mathematics in the Frances Baard District in Northern Cape, South Africa. According to Athanasou et al. (2012), qualitative research involves an exploration of an issue in its natural surroundings thus relying on the data's linguistic descriptions to analyse the data. The purpose of qualitative research is to describe and understand rather than predict and control (Maree, 2020). The qualitative approach is used in this study and with these participants as we need to elicit the "real" feelings of learners and their teachers. The feelings and demeanour of learners will give the researcher an insight into what is happening on the ground. Interviews with the teachers will mean that they will make their feelings clear and say what they feel. This will ensure that the reality of the phenomenon is found in this study. Qualitative research needs to be precise in description and language, because it is an abstract phenomenon and cannot be statistically measured, thus it gives the reader a sense of what the actual experience is (Lune & Berg, 2017). An advantage of using qualitative research is that it makes meaning of human issues in their actual setting (Rahman,

2016). Qualitative research can be composed and recomposed to form an eventual outcome (Rahman, 2016). A disadvantage of qualitative approach is that it is an arduous task, because the relevant data is often difficult to track and capture (Lune & Berg, 2017).

3.3 Research paradigm

According to Creswell and Creswell (2018), interpretivism means that an individual perceives the world from their own thinking. The goal of interpretivist theory in research is to bring this awareness to the researcher in order for her to be aware of the possible bias and to bring the view of the participant to the fore in the study (Creswell & Creswell 2018). Interpretivism seeks to make sure that the integrity of the “person” under study is not undermined (Cohen, Manion & Morrison, 2018). **The researcher chose this paradigm to eliminate the possibility of data contamination. The researcher is a mathematics teacher and this felt the need to become totally aware.** Interpretivism allows the researcher the opportunity to interpret the behaviour (non-spoken role) of a participant during the process (Rahman & Areni, 2016). A disadvantage that may arise in the Interpretivism paradigm is that the participant is able to exercise power over a phenomenon by swaying the researcher into his own thinking (Wang 2020).

3.4 Research design

The case study design allows the researcher to tackle a more specific feature of a phenomenon (Yin, 2014). According to Maree (2020), the case study method allows the researcher to understand a phenomenon in its actual setting, considering the factors in the environment as it occurs. Case study design gives the researcher the opportunity to isolate and define a phenomenon in its actual environment (Karlsson, 2016). A “case” can be an issue under study, a person, place or situation (Athanasou, 2012). A positive characteristic of the case study design is that it allows the researcher

to identify and isolate an issue from its context (Maree, 2020). The case study allows the researcher to make an in-depth interpretation of a situation and then give a realistic meaning to an issue (Karlsson, 2016). One disadvantage of case studies is that it is restricted in its goal, in that it is bounded by the time that it occurs and the method of conducting the process (Creswell & Creswell, 2018). **Case study design has been used in this study as the interaction with the participants will yield a scene of what is really happening in schools and why the learners' marks drop when they reach Grade 7. Mathematics teachers and the learners were interviewed so that the researcher could find out the real situation from the actual people who are experiencing the issue under investigation.**

3.5 Research sites

This study was conducted in six primary schools in the Frances Baard District, South Africa. The schools were situated in an array of places, ranging from townships to the city.

3.5.1 School 1

School 1 is situated in the city and not far from the main malls. The school has an enrolment of 1 000 learners including 100 Grade seven learners. The school is a full fee-paying institution and despite this point, a feeding scheme is available to all learners. According to a teacher at the school, more than fifty percent of the learners receive an exemption. Fifty percent of learners eat at least one meal provided by the school. During holidays and the COVID-19 pandemic-induced lockdown, learners had been given food hampers to take home. The learners come to school by public transport as the school is situated far from the townships where they reside. It is a well organised and well-resourced school, in terms of academic resources, learners' needs, such as food and water as well as sporting and ablution facilities. The school is in the process of upgrading the building, so the cultural activities are being

conducted in the school hall and the recreation area. There are general workers who maintain the school premises. Most of the learners come to school by public transport. There is a steady learning and teaching ethos at the school. The school has a well-organised school governing body that efficiently and appropriately manages the school funds. A newly built foundation phase extension has been built adjoining the current school. The school's governing body has accumulated enough funds for the upgrading of the old building and this is in the process of development. There are sufficient toilets and ablution facilities for both learners and educators. There are approximately 40 learners per class and there are 25 classes in the school. All the teachers are employed by the Department of Education, except one educator who is employed by the School Governing Body.

3.5.2 School 2

School 2 is situated in a very poor township area in the Frances Baard District. This area is also riddled with crime and gangsterism. This is a no-fee paying school, as most of the parents are unemployed. The learners receive all their academic needs, and they also receive two meals at the school. Although the school is comparatively smaller school with only 500 learners, the class sizes are big, accommodating up to 50 learners. The school is unfortunately not well maintained and rather untidy on the outset. Although the Department of Basic Education does pay general workers, it is an arduous task for the principal to maintain the school grounds as there are often electricity cuts and workers often leave work. Working conditions are difficult for the teachers, as the school has no electricity except in the administration block. It is in this administration block where the food is cooked and served to the learners on a daily basis. The school has running water and working toilets, but they are also not well maintained. The corridors had not been cleaned for quite some time, because it is difficult to find a reliable maintenance team from the community.

3.5.3 School 3

School 3 was a private school built on Islamic Ethos, although it follows the Curriculum and Assessment Policy Statement (CAPS) document in its curriculum. The school is independently funded by the Islamic Community of the District. The school has a total learner count of 60-70 children. The Grade 7 class has a total of twelve learners. There are 10 classrooms, and they use a building that has been in use for Islamic classes for quite some time. Although the building is old, it is well maintained. There are general workers who clean the school. There is electricity and running water, the school has ample toilet and ablution facilities to accommodate all the learners in the school. They have a secular education integrated with Islamic education and the school day typically ends at 15:00 in the afternoon. The school does not have a feeding scheme; however, they do run a soup kitchen from the school. One of the school's main focal points is teaching learners social responsibility. The Islamic school does not have the usual problems characteristic of a state school, such as overcrowding and a lack of teacher training. Although the school is funded by the Muslim community residing in Kimberley, all their learners do not pay fees and sometimes have financial issues. The school has many sponsors who donate books and necessities; unfortunately, the donors do not give cash; so the payment of teachers remains at a minimum.

3.5.4 School 4

School 4 is situated in a rural township on the outskirts of the Frances Baard District. It is a moderately maintained school with an enrolment of 1 200 learners. There are two deputy principals and a total of 28 teachers. The school is a dual language school, with English and Afrikaans classes. The school's surrounding areas include a few areas within a suburb and there are many factions, whose social issues sometimes spill into the school thus impeding learning and teaching. The school tries to remain neutral in all these issues. It is a no-fee school and learners receive food daily. The

learners also receive all their learning and teaching materials. The school grounds are well maintained despite the geographical location. The areas around the school do not look very good and the roads are not maintained. The homes surrounding the school have a low-cost housing and people living in them are poor. The other groups coming to the school live in shacks and there is also a hostel in the area and some of the learners who attend this school live in these flats. There is an area that is well-maintained in this area; however, most of the families who live in that area have access to better schools in the district. Crime is very rife in this area and the learners come to school with the hope that they will be able to escape this area. The Mathematics Department is fully functional and five of the seven Mathematics teachers are specialists in their fields. The Mathematics teacher that was interviewed from this school expressed the need for social development in the area as this may help improve the social situation in the school. The principal and teachers are very strict in following protocols set out by the Department of Basic Education of the Northern Cape.

3.5.5 School 5

School 5 is a fully functional and a highly-maintained school. The school boasts a highly maintained sports field, an astro-turf pitch as well as a swimming pool. All these facilities are being used by the learners at the school during extra-mural activities. There are air-conditioners in each class as well as smart boards though the teachers are not trained in the use of the smart board and the school cannot issue licenses to the teachers. This is a full-fee paying school, and there are six hundred learners. The Mathematics teachers in this school are all qualified in the field; however, their training has not been updated. They also offer intervention of all kinds to struggling learners. They have an on-site counsellor employed by the school governing body to counsel learners. The school governing body regulates the usage of funds and maintains the school and all the extra amenities that the school has. The school has a fully functional media centre and extra lessons are offered in media studies.

3.5.6 School 6

School 6 is also highly-maintained and is situated in the suburbs around the city. The school has a swimming pool and a fully functional sports field. The schools' lawns are maintained and immaculately groomed. The school boasts an astro-turf pitch which is rented out and it benefits from these funds. The school governing body employs two extra teachers and a reading coach to supplement the current staff; thus, the teachers are not over-burdened as is the case in many of the poorer State schools. The school has 600 learners and a total of 22 educators. The school has a functional tuck-shop and is able to accommodate Grade 7 learners at school every day maintaining COVID-19 rules of social distance (most schools in the district are unable to accommodate all grades at school every day, due to COVID-19 protocols that have to be followed). The school has a scholar patrol team and a front gate security guard, which means that the teachers do not have to be on duty after school hours. The school's Mathematics Department is well-equipped and adequately qualified for the subject. This school, like the previous school, has adequately qualified teachers but they are not trained in teaching the more modern learner.

3.6 Methods of data collection

This study used two methods of data collection, which include semi-structured interviews, and focus-group discussions (FGDs).

3.6.1 Semi-structured interviews with teachers

This study employed semi-structured interviews (SSI) to solicit data from each teacher. SSI follows a plan, but affords the researcher the flexibility to probe and alternate the questions (Theron & Malindi 2015). Roulston and Choi define SSI as that type of interview that does not have specific questions and flows like a conversation (2018). One positive component of interviews is that the researcher hears a clear description

of the issue in the words of the participants (Maree 2015). Another advantage of SSI is that it allows the researcher to probe into the issue affecting a participant (Szombatova 2016). One disadvantage of SSIs is that it is time consuming and relatively an issue for the researcher as the researcher may not always have accessibility to the participant (Opdenakker 2006). The reason why semi-structured interviews were used is that it allows the participant to bring his own perspective to the study. The researcher planned to use the words of the participants and the factors that emerged came from the actual participants, thus the use of semi-structured interviews. Each interviewee, teachers as well as learners were briefed before the actual interview, they were informed as to the reasons why the interview was taking place. They were also informed with regard to their right in retracting any information that they shared. One participant did agree, and then removed his agreement later, this gives authenticity to the study as he was allowed to do that. He did retract his agreement for interview saying that he does not see the need for an interview as such and nothing will come of it. This was accepted, and the research had recruited other participants to ensure that the study will continue and complete as needed. There were six teachers and each interview lasted for 1 to 2 hours. The interviews conducted allowed the participants to add information as they felt was relevant, and this was controlled and monitored by the researcher. Please find attached the interviews questions which was used as a guide for the interviews. Verbal consent was received from the teachers. Confidentiality was explained to the participants and they agreed that the information could be used in the study. The researcher is bound by they rules of the university in the ethics form as was completed by the researcher.

This technique is divided into two sections such as biographic details and structured questions. Section A consisted of biographical information of the participants including their names and surnames, school, age, race, the other subjects they teach, and their places of residence. The interview questions were divided into two sections namely, the factors that influence the performance of the Grade 7 learner in the Mathematics

classroom, the general feelings of the teachers in the classroom, their development, and whether they have enough resources to assist learners in the class. The second part of the interview focused on the strategies that can be utilised to improve the performance of Grade 7 learners in the Mathematics classroom, the intervention strategies to be used, and questions that interrogate the availability of electronic resources.

3.6.2 Focus group discussions with learners

This study used focus group discussions (FGDs) to collect qualitative data from the learners. The aim of FGDs is to collect data from a specific group of individuals who represent a larger population that is experiencing the phenomenon under study (Nyumba, Wilson, Derrick & Mukherjee 2017). The researcher chose to have focus group discussions with the learners as it is a good method that supports young people start a conversation, thereby yielding rich data (Maree 2015). One advantage of using FGDs is that the data collection method allows the researcher to gather information on an issue that can be used to support other data in the study (Nyumba, Wilson, Derrick & Mukherjee 2017).

One disadvantage of FGDs is that it is possible that the participants may start a debate on the issue, if the researcher does not direct the conversation carefully (Then, Rankin & Ali, 2014). The learners were asked to fill in a form with biographical information, such as their age, race, grade, favourite subject, who they reside with and the number of siblings in their home. The reason why FGDs were used is that the learners are young and with young people, it is always easier to get them to “talk” in a group (Maree 2015). The description of the groups has explained the process of the discussions held with learners (See section 3.6.3 on focus group discussions). Learners’ parents had signed consent forms and this was explained to learners, the whole process was detailed and learners were made aware of the process, and they provided assent. The teachers were also present at the beginning of each discussion to ensure that the

learners were comfortable and once they were comfortable with the researcher the teacher would leave. The teacher did not stay, as learners may feel shy to share sensitive information with the researcher. All the learners did not have a problem with the discussions and partook willingly and they were made aware that they may leave at any time and or withdraw any information shared.

The discussion with the learners was divided into two sections, firstly the experiences of the learners, such as the changes that have occurred for them in their schooling careers, their relationship with their friends and teachers, their future plans, and the needs they have for their future success. Thereafter, the challenges they have such as the obstacles they have in the Mathematics classroom, and the types of intervention they need, some of the most difficult topics they have to deal with, and if they understand their teacher. In EST it is vital that the person's personality is carefully observed during the interview process, this will give important clues as to why and how the individual interacts with his or her environment (Koller et al., 2020).

3.6.3. Focus group discussions

In this study, six focus group discussions (FGDs) were conducted.

3.6.3.1 Focus group discussion 1 (FGD 1)

The first FGD used to extract information from learners took place at the learners' school, that is, School 1. This group had four learners, two boys and two girls. The discussion lasted for one hour and forty-five minutes. The study was conducted in late July 2020. The participants were all friends and seemed to have a friendly relationship with each other. In terms of performance, the learners in this group were medium to average performers. The learners in this group were well-behaved and enthusiastic and they expressed their views willingly. They were not shy to say what they enjoyed and what they neglected academically. They spoke highly of their teacher with due

respect. They were a little shy to talk about their home situations, and did not want to share too willingly. The social situations in the community seemed to be an issue they were not willing to discuss; two of the learners lived in more affluent suburbs and did not have to deal with the issues of the township. They gave the impression that they were happy in the class. The learners knew what they needed to improve their performance. They also were well-informed about what is needed for their overall success. They knew the topics they struggled with and even expressed alternative methods for the teacher to try. Three of them were attending a regular intervention offered by their school. One of them said that he had transport problems, because he had to chaperone his little sister home. They all expressed happiness with their learning environment and showed love for their school. The discussions took place after school, because the researcher did not want to waste learners' learning time. All COVID-19 protocols were adhered to and all learners and the researcher were wearing their face masks all the time.

3.6.3.2 Focus group Discussion 2 (FGD 2)

This group consisted of four learners; two girls and two boys. This discussion lasted for 45 minutes. The discussion took place in the school building, in the staffroom of the school, in mid-July 2021. The learners willingly shared information, although they were a bit withdrawn when it came to the social issues they faced at home. It seemed they were afraid of oversharing information. Learners in this school received food daily and they participated in all cultural activities at the school. Two of the four learners were responsible for taking care of their siblings, feeding, dressing and transporting them to school as their parents had to leave for work early as they worked far into the city and required to take taxis to their workplaces. Discussions were held after school as the researcher did not wish to utilise teaching time. Despite these seemingly difficult situations, learners willingly participated in the interviews and were excited for the opportunity to be part of this study. The learners were not shy and knew what was

expected of them. They understood English very well, though their first language was Afrikaans. They were well-aware of what was needed from them and required for them to succeed academically. They expressed great admiration for their teacher and said that she immensely cared for them and not only as an educator, but also as a caregiver. All the learners from this group expressed the view that the school was the base for their success and considered it as a measure of stability for them. One boy said, *“I love to come to school, because it gives me hope for the future, and I know that things will get better if we come to school every day”*. The school acted as a beacon of hope and strength for these youngsters, despite the many drawbacks that it had been experiencing. The teacher participant was very passionate about giving these learners the best possible hopes and dreams for their future. All COVID-19 protocols were adhered to and all learners and the researcher were masked all the time.

3.6.3.3 Focus group discussion 3 (FGD 3)

There were four learners in this group, and they comprised two boys and two girls. This group was selected from School 3. This FGD occurred at the end of July 2021. The group members were friendly to each other. This discussion was scheduled for a Saturday as learners had extra-Mathematics classes and after class activities the discussion was held and it lasted for two hours. At first the learners were quiet and reserved; they did however share the information needed from them for the purposes of the study. Although they were selected from a private school, they had the same social and emotional issues as other learners. This group also had a soup kitchen at their school as part of the social responsibility that is placed upon them by the school they attended. They understood what was expected from them academically for optimal performance. This group was fully aware of their weaknesses in their mathematical abilities. There was quite a considerable degree of brotherhood among the boys, and they seemed to look out for each other. They showed appreciation for

their mathematics teacher and loved working with her. All COVID-19 protocols were adhered to and all learners and the researcher always wore their masks.

3.6.3.4 Focus group discussion 4 (FGD 4)

This group had four learners, three boys and one girl. The focus group discussion was held at their school, in a designated classroom. This group was from School 4. The discussion took place at the end of July 2021. This group was predominantly also Afrikaans speaking. The learners in this group were very forthcoming with information. This discussion lasted 1 hour and 30 minutes. They had some social issues in their communities, and this would sometimes become a hindrance to their academic performance. The learners in this group come to school by public transport. They respect their teacher and know what they need to do to succeed. They are fully aware of the problematic topics. This group also showed some reservation with regard to the social issues at school. Although they came from a community riddled with social ills, the whole group was enthusiastic about the future and knew exactly what they wanted to be and what was required from them. All COVID-19 protocols were adhered to and all the learners and the researcher wore masks all the time.

3.6.3.5 Focus group discussion 5 (FGD 5)

This group had three boys and two girls selected from School 5. These learners hailed from a higher socio-economic group and they did not present with the same social issues as the learners from the more rural schools. Their school is located in the middle of the city and they used public transport to get to school. They were aware of the regular social ills like gang violence perpetrated by gangsters in the city. However, they were not directly affected by these issues, as they lived in a better part of the city. They did however express their concern with high school acceptance, as this was a problem in the whole district. This group was forthcoming with information, though the learners were less inclined to share information on their family lives and social

backgrounds. They knew the issues that affected their performance and expressed the need to acquire study skills. They were also very well-informed about what was required from them. This group admitted that they had many external distractions. Most of them said that they had a good relationship with their parents and they did not have social issues that hampered their teaching. They respected their teacher and had great confidence in her teaching methods. All COVID-19 protocols were adhered to and all learners and the researcher always wore their face masks.

3.6.3.6 Focus group discussion 6 (FGD 6)

There were four learners in this group, two boys and two girls. The learners came from medium and high performing groups; thus, they did not present any academic problems. The discussion with this group lasted for an hour. They did express their views thoroughly and were fluent in the English language. They knew their weaknesses and also knew how to eradicate these weaknesses. They had little or no social issues, and the researcher felt they were not prepared to share information on the subject just like the previous group. They expressed fear for their teacher; thus, they did not misbehave and did their homework timeously and properly. The group was a mixture of different personalities and were happy to partake in the research. They worked well as a team, and had a kind of brotherhood amongst them. The interview was conducted after school hours and no learning time was taken from the learners. All COVID-19 protocols were adhered to and all the learners and the researcher always wore their face masks.

3.7 Procedure for data collection

After ethical clearance was received from the University of the Free State and The Department of Basic Education, the researcher identified the different schools that were chosen to be part of the study. An appointment was made with each of the principals to seek their permission to conduct the study. All the principals agreed that

their school may be utilised in the study; however, they indicated that teaching time should not be used for this purpose. The researcher contacted each teacher at least one month prior to the commencement of the data collection process. Time and venue were mutually chosen and agreed upon when the researcher met with each of the participants. Before the interview started, the researcher briefed the participants on the background of the study. The interviews lasted between an hour and thirty minutes and two hours. All COVID-19 protocols were adhered to during the interviews. The researcher asked the teachers to give letters to identified learners who would be willing and able to share the richest data with the researcher. The teachers then facilitated the FGDs. The researcher held the FGDs with each group at its respective school. The interviews and FGDs were recorded electronically. Within a day after the interviews and FGDs were held, the researcher transcribed each interview and FGD. The transcriptions were stored electronically and placed on a memory stick. Thereafter, researcher embarked on the data analysis process.

3.8 Mechanisms for the selection of participants

3.8.1 Population

According to Cohen, Manion and Morris (2018), the population consists of the total number of individuals in a study. The total population in this study were all the learners in the Frances Baard District. By virtue of being a case study, the researcher used purposeful sampling to choose a target group of six schools to participate in the study. According to Creswell and Creswell (2018), there is a need to select participants that add the best data to enrich the study. Purposive sampling allows the researcher to retrieve in-depth information; however, it limits the study to a small sample (Cohen et al., 2018). One disadvantage of purposive sampling is that all the participants may have different opinions (Cohen et al., 2018). The teachers were the best candidates as they are the closest, most relevant stakeholders in the education of learners.

3.8.2 Sampling technique

This study used the purposive sampling technique to select participants. According to Cohen et al. (2018), this sampling technique is usually used for small-scale to medium-scale studies. The sample was chosen from the total population of learners in the district. The sample size ought to be identified from the total population, according to accessibility and availability of the participants (Cohen et al, 2018). In qualitative studies, the sample size is usually smaller (Merriam & Tisdell, 2016). A strength of purposive sampling is that the participants are chosen according to what they can bring to the study, they are specifically chosen as they have the necessary experience as well as the ones going through the phenomenon of interest. In this study, the learners are the ones whose marks are dropping in Grade 7 and the teachers have had some experience in teaching Grade 7 Mathematics, thus they carry in-depth knowledge in their field. The recommended number of learners is 5 to 12 participants (Maree, 2015). This is a limitation of this study as the FGDs had only four participants. The reasons why this group was smaller, is that it is a qualitative study and the researcher felt that it may be beneficial to have a smaller group. It will be easier for the learners to discuss information with the researcher. One disadvantage of purposive sampling is that only selected participants get an opportunity to have their opinion taken (Cohen et al., 2018).

3.8.3 Criteria for selection of participants

The criteria for selection of participants were:

Teachers:

1. Should have at least 5 years' teaching experience.
2. Should be mathematics teachers in the Frances Baard District.
3. Should be teaching in public schools, teaching the CAPS curriculum.

4. Should all live in the Frances Baard District and this means that the teachers are able to have the interviews with the researcher.
5. Should be trained and teaching in the field of Mathematics.
6. Should be willing to participate in the study.

Learners:

1. Should be learners from Grade 7, with their ages varying between eleven and thirteen. Should be selected on the basis of their willingness to participate in this study.
2. Should have the ability to express themselves regarding their experiences and challenges in the Mathematics classroom.
3. Selected from schools in the Frances Baard District, in the Northern Cape Province.
4. Should reside in the urban and rural areas.

3.8.4 Sample size

The sample size of the study involves six teachers ($n=6$) and twenty-four learners ($n=24$) from six schools. The participants were willing to be part of the study and were chosen by the researcher herself (School 1: one teacher [$n=1$], and four learners [$n=4$]; School 2: one teacher [$n=1$], and four learners [$n=4$]; School 3: one teacher [$n=1$], and four learners [$n=4$]; School 4: one teacher [$n=1$], and four learners [$n=4$]; School 5: one teacher [$n=1$], and four learners [$n=4$]; School 6: one teacher [$n=1$], and four learners [$n=4$]).

3.8 Data analysis

This study used thematic analysis (TA) to analyse the collected qualitative data. According to Mills, Durepos, and Wiebe (2012), TA is referred to as an approach to the analysis of data, a strategy to organise and bring meaning to data. The main point

that should be considered when analysing data is that it should be categorised according to certain themes, which form the main tenets of exploration (Mills, Durepos, & Wiebe 2012).

Regarding TA, researchers look for recurring themes, especially those that are recognisable, and so outstanding that they make a discernible pattern (Boyatzis, 2018) in Mills, Durepos & Wiebe, 2012). An advantage of TA is that data coding does not allow the researcher's own biases to contaminate the data, as the themes repeat themselves as they come from the participants (Bryman, 2012). Another positive attribute of TA is that it is flexible in nature; thus, it allows researchers to use it in any possible method and it is still important for the researcher to stick to the recurring themes (Hawkins & Allen, 2018). One disadvantage of TA is that some recurring themes may not be important to the study, and this may mislead the research (Braun & Clarke, 2012). If the nature of the research is relatively new and not easily recognisable, this will be most suitable (Hawkins & Allen, 2018).

TA is flexible by nature, and can thus be used to discover themes, issues, similarities and differences that occur within various sizes of data set (Hawkins & Allen, 2018). Putting TA into the context of this study, there are six steps to follow (Terry, Hayfield, Clarke & Braun, 2021).

The first step in TA is becoming familiar with the data, by reading it with a critical insight and deep thought. After the interviews were carried out, data transcription was done, giving the researcher a chance to interact with the data. The researcher read the data and found patterns and similarities in data sets. The second step is to categorise and code the data according to what is contained in each piece of information. The third step involved the researcher creating themes that emerged from the data. The recurrent themes become the main themes, which will be used to elaborate data. The fourth step involves taking the themes and refining them, utilising the most relevant information and trimming the irrelevant one. The fifth step of TA involves defining and

finalising data. The sixth and final step is the writing of a report on the collected data. Even though this process begins at the start of data collection in qualitative research, at this juncture a conclusion is brought to the data collection process.

3.9 Trustworthiness and credibility of the findings

Trustworthiness is a key component of research and therefore must be kept in mind at all times. The steps and methods on how data should be managed must be carefully considered and evaluated constantly (Maree, 2020). Four facets of trustworthiness to consider are credibility, transferability, dependability and confirmability (Guba, 1981). The researcher in qualitative research is a research tool anyway, so the trustworthiness of the researcher is brought under scrutiny. Every detail was recorded electronically, soon after the recording was done the information was transcribed. This information was later shared with the participant to confirm what was said, and to ensure that the participant was happy with the information as it was relayed to the researcher. When a clear and concise system of data gathering and record is kept of everything, this contributes to the dependability of the study (Maree, 2020).

Athanasou et al. (2015) consider the use of different sources of data to enhance the validity of the study. The sources should be at different levels in the same field (Athanasou et al., 2015). Data was collected from learners and from teachers, thereby enhancing the validity of the study. Crystallisation of the data was achieved by eliciting the different perspectives and adding to the study (Athanasou et al., 2015). By employing the above-cited methods to ensure validity, the researcher will provide a deeper understanding of why the learners struggle in Grade 7 Mathematics in the Frances Baard District.

3.10 Limitations of the study

The limitation of the study is that only public schools and only one private school were included in the study. Thus, the generalisability of the study cannot be guaranteed. The study focussed on one exit grade of the phases in the CAPs system, Grade Three (exit grade for foundation phase) and Nine (exit grade for senior phase) was not considered, the thought of the researcher is that Grades 3 and 9 should also be considered for a similar study, as they are also exit grades. The study was only conducted in the Frances Baard District, Northern Cape Province in South Africa. This is predominantly a rural area. If the study was conducted in a more densely populated society, the results may yield more themes, as the learners in the bigger cities may be exposed to more issues concerning the Mathematics classroom. This study only interviewed learners and teachers; it may yield a richer result if the parents of learners were also included in the study. **The focus group was smaller than recommended, thus there may be some missing data.** In the curriculum aspect, it would be interesting to establish the opinions of teachers on a variety of subjects, and how learners fare in languages and the more scientific subjects such as Natural Sciences and Technology.

3.11 Ethical considerations

The permission to conduct the study was sought and received from the Department of Education, in the Northern Cape Province, where the Frances Baard District is situated. Permission was also sought from the Ethics Department of the University of the Free State and was granted. Permission was also sought from the participants to gain their commitment during their participation in the study. The researcher sensitized the participants who would be part of the study and kept them informed on the progress of authorisation being awaited (Theron & Malindi, 2015). The researcher made every possible effort to make the participants comfortable in order to gain the best information from them, and part of research strategies include being sensitive to the feelings of the participants around the researcher. The researcher made every

effort to keep a backup of all the electronically retrievable data on a separate hard drive, and this would be the second place where it is kept (Theron & Malindi, 2015). All parents of learners completed a generic permission form received from the Ethics Department of the University of Free State. Learners and teachers were asked to fill in a biographical form to give the researcher insights into the participants' personal lives. The biographical information included: participant's name and surname, race, age, location, other subjects taught and teaching experience. Learners and teachers' real names and surnames were not used in the study and anonymity was ensured to protect participants' identities. The researcher took care to ensure that all participants remained anonymous. The study avoided causing harm to anyone as the problem experienced was universal and no single individual can be implicated. The researcher made sure that all teachers were provided with the appropriate transportation and support as and when need arose. One participant was on a "teams" meeting and willingly offered his own resources.

3.12 Conclusion

This chapter has illustrated the research methodology used to collect data for this study. The study used a qualitative research approach, along with an interpretivism paradigm. The study employed a case study research design. The chapter described six primary schools that were the research sites in the Frances Baard District. The two methods of data collection which were used in this study were also described, and these are semi-structured interviews held with teachers and focus group discussions (FGD) held with learners. A brief description of each FGD has been presented and the data collection procedure has been described, together with the population who are the teachers and learners who are associated with Mathematics learning in the district. Purposive sampling was used to select the participants, who comprised six teachers and twenty-four learners that included six groups with four learners each. Thematic analysis was used to analyse the collected data. Thematic analysis derives

the themes from the data, and when these themes recur, they form the basis for the analysis. The trustworthiness and credibility of the study were elucidated by crystallisation and trustworthiness by the credibility, transferability and dependability of the data. Some limitations of the study included the fact that the study focussed only on one exit grade of one phase, and it was limited to one district, which is rural in nature. The subject under study was also limited to one subject. Lastly, ethical considerations were included and permission was sought from the relevant parties involved in the study.

CHAPTER 4: PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the qualitative results of the study. It presents the biographic results from participants (teachers and learners) and the thematic results of the study. The themes that emerged will be discussed in this chapter. These include psychological, social, and academic factors that influence the performance of Grade 7 learners in Mathematics and, Grade 7 learners' experiences and the challenges they face in the Mathematics classroom. The chapter also explores the strategies teachers adopted to enhance the performance of Grade 7 learners in the Mathematics classroom. A short summary concludes this chapter.

4.2 Aim and objectives of the study

The aim of the study was to explore the factors that influence the performance of Grade 7 learners in a Mathematics classroom at primary schools in the Frances Baard District.

The objectives were:

1. To explore the experiences of Grade 7 learners in Mathematics at primary schools in the Frances Baard District.
2. To explore the challenges that Grade 7 learners encounter in Mathematics at primary schools in the Frances Baard District.
3. To determine the strategies that enhance the Grade 7 learners' performance in Mathematics at primary schools in the Frances Baard District.

4.3 Biographic results

This study reported the biographical results obtained from teachers and learners.

4.3.1 Biographical results from teachers

Table 4.1 Biographical data from the teachers

Participan ts	Schools	Age	Teaching experien ces	Race	Gender	Qualificat ion	Home Languag e	RA	Teaching subject
Teacher 1	School 5	31	10	C	Female	PGCE/ BSc. HMS	English	Urban	Math PE Tech
Teacher 2	School 6	53	20	W	Female	Dip Ed/B.Ed.	English	Urban	Math SS
Teacher 3	School 3	55	4	C	Female	B Acc.	Afrikaans	Urban	Math EMS
Teacher 4	School 4	56	25	C	Male	Dip Ed/ B Ed.	Afrikaans	Urban	Math
Teacher 5	School 2	33	9	A	Female	B.Ed.	Tswana	Urban	Math
Teacher 6	School 1	42	10	W	Male	B.Ed.	English	Urban	Math PE Tech

PGCE: Post Graduate Diploma in Education

B. Acc: Bachelor of Accounting

Dip. Ed: Diploma in Education

B Sc.: HMS: Bachelor of Science in Human Movement Science

B.Ed.: Bachelor of Education

Math: Mathematics

PE: Physical Education

SS: Social Sciences

4.3.2 Teacher 1

Teacher 1 was a thirty-one-year-old Coloured female and a sportswoman from School 5. She enjoyed her free time watching movies and perfecting her hockey game. Her initial qualification was in Human Movement Sciences. Although teaching was not her first professional choice, she started teaching because of family pressure. Although her PGCE is in Mathematics, she does not do any development in her training currently. She started loving the subject as she saw progress in the learners' ability and development. She has been teaching Mathematics in the past 10 years. She lives in an urban area in the same district and short-drives to the school where she teaches. Her other subjects are Sports and Technology. She prefers Mathematics because it is always interesting and poses a challenge when learners struggle with some concepts. Her challenge in Mathematics is reaching out to the learners as they have a negative attitude towards the subject. The participant sounded frustrated and unhappy with her teaching. During her years of teaching, she seemed to have lost her passion for the subject. She was not very empathetic to learners' social and emotional needs and said, "Education in South Africa is free, they have no reason to fail, they do not want to work". She admitted that she was not aware of learners' social situations and equally uninterested in it. She felt that she was in school to teach Mathematics and not to heal them, psychologically.

She enjoyed coaching the school hockey team as she was a hockey player herself. She was an emotionally balanced individual capable of handling the class efficiently. She insisted that if a teacher respects learners, they are obliged to reciprocate. She said she did not use any form of discipline as she does not need it; neither did she feel it was her responsibility to reward learners if they did well. However, she indicated that she applied intervention strategies while teaching in the class, if learners do not understand a concept; she professed that she immediately devised a new strategy to teach them and make sure that they have understood the concept.

4.3.3 Teacher 2

Teacher 2 was a 53-year-old White female from School 6. She held a Bachelor's degree in Education, and lives in an urban area near the school. She has twenty years of teaching experience in Mathematics. Her initial teacher training was in Mathematics, but she had not done any current development in the field. She has always loved Mathematics and became a teacher because she loved working with children. Her love for Mathematics grew as she realised how learners developed and became 'smarter' through Mathematics. She had witnessed the learners become academically weaker and weaker through the years, with their resilience waning gradually. She is passionate about teaching Mathematics, and her other subject is Social Sciences. She loves teaching learners' new things, which is obvious when she is teaching, as learners are also more enthusiastic when excited about a topic. Although she has a soft and quiet voice, the learners in her class are generally well-behaved, and she did not have disciplinary issues in her class. She was not always delighted by learners' results, as this shows that they were not fully engaged in her class. She felt that she did not know her learners very well and wished she had more opportunities to get to "know" her learners better on a social and emotional level. She acknowledged that learners' emotional and social situations affected them and regretted that she was not

very well-informed about their situations. She was about ten years away from retiring, but her feeling was that she had spent too many years teaching and would like to explore other fields of work.

4.3.4 Teacher 3

Teacher 3 was a fifty-five-year-old Coloured female and a holder of a degree in Accounting and she decided to teach because she needed a break from the pressure of the corporate world. She resided in a rural area adjacent to the school where she taught. She taught Mathematics from Grade 4 through to Grade 7 and Economic Management Sciences in Grade 7 as she had an accounting background. She loved teaching because it is a hobby and was “lucky” to get the teaching job in a private religious school. She did have small classes and did much intervention with learners; thus, the school always enjoyed a 100% pass rate. She did not have the usual disciplinary problems and low-resources in her school. The challenges she grappled with were social and emotional issues manifesting in learners. She felt that the COVID-19 pandemic had affected her learners emotionally. She was happy with her teaching and had been a catalyst in doing social work in her school. She was running a soup kitchen along with the Grade 7 learners and felt fully engaged with her learners at an emotional and social level. She absolutely loved her job and the children make her happy. She felt that teaching had become a coping mechanism for her, as she had to deal with many emotional issues in her personal life.

4.3.5 Teacher 4

Teacher 4 was a fifty-six-year-old Coloured male from School 4. His first language was Afrikaans and he lived in an urban area not far from his school. He was part of the management team of his school; thus, coupled with his teaching duties, he had many administrative duties. He had been a teacher for quite some time and had to teach for just 5 years before retiring from service. He had been teaching for twenty-

four years and these years have been spent in the mathematics classroom. His initial teacher training was in Mathematics, and he did no current development in the field of Mathematics. He used his own methods and admits that he did not use too many of the more modern methods of teaching. He did his own intervention and most of the time the learners understood his methods. He had low tolerance for learner frivolities and did not entertain mischief or unruly behaviour in his classroom. Due to his strict personality, he hardly needed any form of discipline; despite this, he had a good emotional attachment with his learners. He was an experienced teacher and because he was on the management team of the school, he was well-informed about the social and economic standing of his learners. He paid home visits to learners who did not adhere to school rules, in an effort to combat mischievous behaviour to a holistic level. The teacher felt that it was more difficult to be a teacher than to be a pastor in the current world. Learners at his school had too many emotional and social issues to deal with. The community the school is situated is one that is very rough and there is often in-fighting among the different localities within the area. Although they are all from a lower-economic suburb, the different groups have many social ills and gangsterism is one of their many issues. He loved teaching and was prepared to do anything for the community in which he taught.

4.3.6 Teacher 5

Teacher 5 was a thirty-three-year-old African female teaching in School 2. Her home language is Setswana and she taught Mathematics in English. The school is situated in the middle of a township that is prone to crime and vandalism. They only have electricity in the administration block which is where the principal's office, the school hall and the school kitchen are located. There is only one photocopy machine, but somehow, they manage. The teacher taught Mathematics from Grade 4 through Grade 7. She used the school hall to teach as she enjoyed using the overhead projector to show the learners mathematical videos and she also used e-classroom

material. She paid for these by herself as she felt her learners were an investment in the future of South Africa. She was very proud of the fact that fifty of her two hundred Mathematics learners had qualified for a math Olympiad in 2020. She was very passionate about teaching especially in the rural areas. “The learners there are poor and their parents are unable to send them to the better schools in the district.”

She worked closely with the Maths coach and the social worker for the enhancement of the social and emotional status of the learners in her school. She was a product of a similar school and ever so grateful for the opportunity she was afforded and this was the reason she so passionately wanted to give back to her community.

4.3.6 Teacher 6

Teacher 6 was a forty-two-year-old White male, who is teaching mathematics at school. English was not his home language, and although he struggled in the beginning, he had become efficient in teaching Mathematics in his second language. He lived in the same area as his school, and he walked to school. Thus, he did not feel that home language and the language of teaching and learning hampered the performance of learners. He was a software developer by profession and chose to teach Mathematics due to his love for teaching. He had a PGCE in Mathematics. He also held an advanced certificate in Mathematics. His teacher training was in Mathematics and he did no current development in teaching. He used technology in the form of videos which he allowed the learners to watch. He was a big supporter of technology in the classroom and would love to see the upgrading of schools to the newest technology. He believed that the classrooms teachers are currently teaching are outdated, but teachers have to make the best of what they have. He was passionate about the social circumstances of his learners. He did whatever he could to make the lives of learners easy and also loved involving parents in all his decisions. He was a sportsman and during his free time he coached the school cricket team. He did not have a disciplinary problem in his class and wished that he could have more time to teach the topics that

needed extra time. He also taught Technology and Physical Education. He would approach learners on a holistic level and would love to do more for them to enrich them emotionally. He was passionate about his religion and believed that the salvation of learners lied in the faith of a higher power.

4.4 Biographical data from learner participants

Table 4.2: Biographical data from learner participants

Focus-Group Discussions		Gender	Age	Race	Home Language	Schools	Geographical location
FGD 1	Learner 1	Male	11	African	Setswana	School 1	Urban School
	Learner 2	Male	12	African	Setswana		
	Learner 3	Female	11	African	Setswana		
	Learner 4	Female	11	African	Setswana		
FGD 2	Learner 1	Male	11	African	Setswana	School 2	Township School
	Learner 2	Male	11	African	Setswana		
	Learner 3	Female	12	African	Setswana		
	Learner 4	Female	11	African	Setswana		
FGD 3	Learner 1	Male	11	Somalian	English	School 3	Urban School
	Learner 2	Male	12	Indian	English		
	Learner 3	Female	11	Coloured	English		
	Learner 4	Female	11	Indian	English		
FGD 4	Learner 1	Male	12	Coloured	English	School 4	Township School
	Learner 2	Male	11	Coloured	English		
	Learner 3	Female	12	Coloured	Afrikaans		
	Learner 4	Female	12	Coloured	Afrikaans		
FGD 5	Learner 1	Male	11	African	Setswana	School 5	Urban School
	Learner 2	Male	11	African	Setswana		
	Learner 3	Female	11	Coloured	Afrikaans		
	Learner 4	Female	11	African	English		
FGD 6	Learner 1	Male	11	Coloured	Afrikaans	School 6	Urban School
	Learner 2	Male	11	African	English		
	Learner 3	Female	11	Coloured	English		
	Learner 4	Female	12	Coloured	English		

FGD: Focus group discussions

Each focus group came from the same school, and learners were in similar situations.

4.5 Thematic results

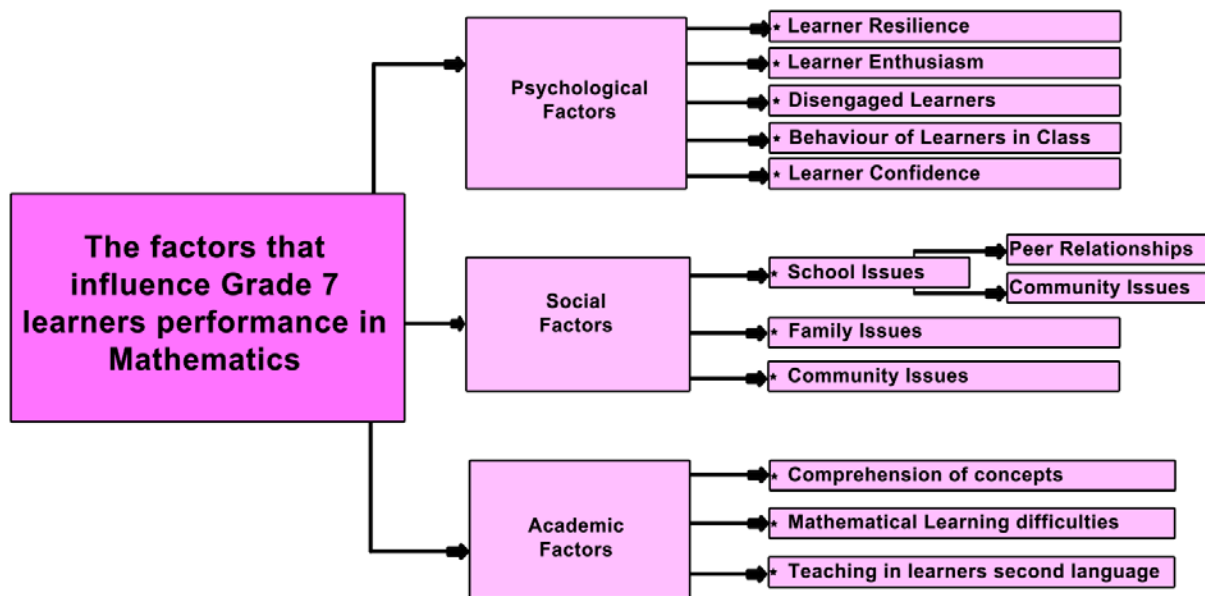
Table 4.3: Summary of thematic results

The factors that influence Grade 7 learners performance in mathematics	Psychological factors	Learner resilience		
		Learner enthusiasm		
		Disengaged learners		
		Learner anxiety		
		Behaviour of learners in the class		
		Learner confidence		
	Social factors	School issues	Peer relationships	
			Teacher relationships	
		Family issues		
		Community issues		
Academic factors	Comprehension of concepts			
	Mathematical learning difficulties			
	Teaching mathematics in the learners second language			
The experiences of Grade 7 learners in the mathematics classroom	Enthusiasm of learners in the classroom			
	Comprehension of concepts			
	Motivation learners feel in the mathematics classroom			
	Peer-assisted learning			
	Positive learner-teacher relationships			
	Positive socio-economic environment			
The challenges encountered by Grade 7 learners in the mathematics classroom	Anxiety experienced by learners			
	Peer disruptions			
	Time management			
	Misunderstanding of topics			
	Negative learner teacher relationships			
	Shortage of learning resources			
	Negative socio-economic situations			
Strategies that can be used to overcome academic challenges experienced by learners	Extra classes			
	Employing the services of a math coach			
	Using of electronic technology			
	Consolidation of topics			

4.5.1 Factors influencing the Grade 7 learners' performance in Mathematics

This study found that psychological, social and academic factors could influence the performance of Grade 7 learners in Mathematics classroom at primary schools in the Frances Baard District.

Figure 4.1: The factors that influence Grade 7 learners performance in Mathematics



4.5.1.1 Psychological factors

This study indicated that resilience, enthusiasm, disengagement, teacher attributes, anxiety, learners' demeanour, and confidence could be considered as psychological factors influencing the performance of Grade 7 learners at primary schools in the Frances Baard District.

4.5.1.1.1 Learner resilience

The responses from participants' transcripts indicate that resilience could be considered a psychological factor influencing the performance of Grade 7 learners at primary schools. Some teachers highlighted that learners' are able to cope with situations that normally affect them negatively, like COVID-19 lockdown on schools. They stated that learners are resilient when they persist with their school work in order to be successful. They often work hard and accept responsibility for their learning when they are satisfied in their classroom. One teacher said resilience occurs when learners persist in a task till they master it. They show resilience by bouncing back and staying on their feet when they are faced with a complicated situation. In spite of the difficulty that learners experience, they can still do their work and be productive individuals. Adults perhaps underestimate the resilience of learners, thinking that they are weak, but actually because they are young, they may be able to grow the resilience from their situations.

The extracts from six teachers illustrate these findings, thus:

“Learners’ emotional situations carry them and make them either strong or weak” (Teacher 1).

“Although they are experiencing difficulties, learners still do well” (Teacher 2).

“Children come from difficult situations. These are children that rise above their situation, and they become strong people. Their minds work differently from the minds of other people” (Teacher 3).

“Learners are very resilient, more resilient than we give them credit for. We need to come down to their level. I make them resilient in how I teach” (Teacher 5).

“Learners have low resilience; it is the odd child that perseveres through the difficulty. Some do not even try and in a class of 40, I reach 4-5 children, 10% of learners. That is scary” (Teacher 6).

“Learners have emotional resilience in that they can cope with all the difficulties that they experience and still I have learners that are successful” (Teacher 2).

One experienced teacher mentioned that learners today do not show resilience, compared to learners ten years ago.

“They do not make enough effort and do not perform to the best of their abilities” (Teacher 3).

4.5.1.1.2 Learners’ enthusiasm displayed in the classroom

The responses from participants’ transcripts revealed that learners’ enthusiasm could be considered a psychological factor influencing the performance of Grade 7 learners in Mathematics at primary schools. Teachers stated that learners’ feelings in the class determine the level of their satisfaction and success. The enjoyment and attention that learners show in class is a sign of their happiness. Their willingness to come to school regularly and participate in their lessons also indicates their happiness. The level of engagement within the classroom is a sign of learner satisfaction in the classroom. The extracts from four teachers explain these.

“If they are enthusiastic and want to learn, then it will be better” (Teacher 1).

“If a child is working in class, this means they are comfortable in that space and they prosper” (Teacher 2).

“Nothing breeds success like success. Mathematical thinkers are good at it and this shows enthusiasm” (Teacher 6).

“When learners are there to learn, and if they love the subject, they will be enthusiastic and progressive” (Teacher 4).

4.5.1.1.3 Disengaged learners

The responses from participants’ transcripts reported that disengagement could be considered a psychological factor influencing Grade 7 learners’ performance at primary schools. Teachers mentioned that learners do not openly declare their

unhappiness in a class; they display it in the form of disengagement. They become disruptive and inattentive to the educator. They become lackadaisical in their work. A teacher mentioned that some learners display anger by becoming violent towards others and the environment. An educator expressed her concern over learner disengagement which manifests in their results. Ultimately, learners' emotional instability shows up in their dissatisfaction with classroom activities. Learners' unhappiness becomes evident in their disengagement in class. They are not adults and will therefore not express unhappiness in words; hence, their disengagement will be an indicator of their feelings.

The extracts from four teachers explain these perceptions.

“Learners do not show dissatisfaction; they display disinterest and are not focused. This can be seen in their marks. Sometimes, learners show dissatisfaction by displaying anger” (Teacher 6).

“They do not show dissatisfaction in the way we think; rather, they act it out” (Teacher 5).

“Learners do not openly show dissatisfaction in the classroom openly, they do however display defiance in the form of not working, sometimes they do not pay attention” (Teacher 1).

“Learners are behaved but I do not know if they are fully engaged. Their marks do not display that they are fully engaged, though they show that they are busy with school work” (Teacher 1).

“I would like them to be more engaged, they appear to be working” (Teacher 4).

“Learners will always appear as if they are busy. I believe that they are, as they do well” (Teacher 2).

4.5.1.1.4 Learner anxiety

The responses from participants' transcripts reported that learner anxiety among the Grade 7 learners could be considered a psychological factor that influences their

performance in the Mathematics classroom at primary schools. Teachers stated that Grade 7 learners experience anxiety in the Mathematics classroom. This kind of anxiety causes a decline in learners' performance. Anxiety is usually expressed as a feeling of fear. Teachers said that some learners are afraid of talking to them. One teacher also expressed the observation that learners have felt some sort of anxiety during COVID-19 pandemic and this has caused some decline in their performance in the Mathematics. Anxiety can also be extreme in that it can cause sickness among the learners. Anxiety is often exacerbated by their friends, who pressure them into certain behaviours. A teacher expressed the view that she regrettably did not have enough opportunity to show concern for a learners' situation. Another teacher said that there are learners who show anxiety due to the nature of the subject.

The extracts from four teachers explain these perceptions.

"Learners experience anxiety and difficulty through the issues they are faced with on a daily basis. Some experience anxiety because of COVID-19" (Teacher 5).

"Learners experience anxiety, although it is not clearly obvious as they do not openly show it. They can only show it when they have an opportunity. I haven't given them enough opportunity to speak about their issues" (Teacher 6).

"Some of the learners do experience anxiety. There is one girl who constantly faints in class, and this causes difficulty in her performance, and that of other learners, sometimes" (Teacher 4).

"Some learners have anxiety from the subject, while others display anxiety from the school. If a child is bullied by friends or even the teacher, then they will not be able to learn" (Teacher 1).

4.5.1.1.5 Behaviour of learners in the classroom

The responses from participants' transcripts indicate that the behaviour of Grade 7 learners could be considered a psychological factor influencing their performance at school. Teachers said that learners' demeanour in the classroom is a deciding factor

in their performance. Learners behaving well and engaging with the teacher and school-work shows in their performance. Teachers have expressed the view that the performance of learners signifies learners' behaviour in class. One teacher expressed a negative situation with regard to the climate of the class affecting the learner's performance. A culture of learning in the school positively impacts the performance of learners. The behaviour of learners in the class largely depends on the teacher, that is, if the teacher is able to maintain discipline by applying the framework of rules setting and respect. Teachers who are able to control learners do not have these kinds of disciplinary issues in their classes. Teachers proposed that they control the behaviour of the learners.

The extracts from five teachers reiterate these notions.

"Some learners are sitting in the hall, but even the ones sitting in the classrooms are not well-behaved. More than half of the learners are battling" (Teacher 4).

"During COVID-19, the classes were smaller; hence, it is better we keep a finger on the pulse. The learners will struggle when all the children come back" (Teacher 2).

"Learners are just not interested in what we teach them" (Teacher 5).

"I do not have a disciplinary problem in my classes. My learners are generally well-behaved and they do not give me any problems" (Teacher 1).

"They are given rules right at the beginning and they know what is expected of them. Learners will only misbehave when the teachers give them the permission to do so" (Teacher 4).

4.5.1.1.6 Learner confidence

The responses from participants' transcripts reported that the confidence of the Grade 7 learners could be considered a psychological factor that influences their performance at primary schools. Learners display confidence in the class when they are sure of themselves, and they are not afraid of making a mistake. They do so when

they have received adequate support from their teachers and parents. They also show confidence when they know something. Learners' self-esteem is boosted and they feel important and this is vital for raising performance in the classroom. Learners' success leads to their confidence in the classroom. When they do well, they will have confidence and if they struggle academically, their confidence will wane. When learners understand the work they are doing in class, they will have confidence, which subsequently enhances their performance. The extracts from four teachers explain these findings.

"Their confidence shows clearly when they perform well and successfully. They even have some superior feelings about their work" (Teacher 6).

"Their confidence in Mathematics varies according to their ability. When they know their work, then it becomes easier for them, and they will be more confident" (Teacher 5).

"Learners' confidence in Mathematics makes them feel important and capable and that is very important for academic performance" (Teacher 1).

"Those that have their basics sorted will have confidence while others do not" (Teacher 2).

4.5.1.2 Social factors

This study demonstrated that the social factors that influence the performance of Grade 7 learners in the Frances Baard District could also apply in the school, the family and the community.

4.5.1.2.1 In the school

a. Learner-learner relationships

The responses from participants' transcripts reported that peer relationships could be considered a social factor that influences the performance of Grade 7 learners. The

relationships that learners have with each other have an impact on their performance. At Grade 7, learners are very subtle in their mannerisms and the way they interact with each other. One teacher said that there is bullying among the girls, though it is very covert. The extracts from four teachers confirm these scenarios. The responses from participants' transcripts reported that peer relationships could be considered a social factor that influences the performance of Grade 7 learners. The relationships that learners have with each other have an impact on their performance. At Grade 7, learners are very subtle in their mannerisms and the way they interact with each other. One teacher said that there is bullying among the girls, though it is very covert. The extracts from four teachers confirm these scenarios.

"The interactions in our school are subdued as it is a very small school. There are no major issues, socially" (Teacher 4).

"We have girls that form groups and one wants to be worse than the other. Maybe it is hormonal and they are problematic. They are urging each other on, trying to be difficult" (Teacher 5).

"The groups of learners from the different areas have a problem with each other and this has become a problem for the school" (Teacher 6).

"When learners are in a group, they learn from each other, and this is beneficial for them and for the whole class" (Teacher 2).

Despite these situations, the learners can still perform well. The groups in classes motivate each other positively. The extracts from two teachers explain these findings.

"They can perform in spite of the friendly situation in the class" (Teacher 1).

"The culture of our school is that most learners will learn, because their groups are competitive and want to compete for the best position" (Teacher 6).

b. Learner-teacher relationship

The responses from participants' transcripts show that teacher attributes could be considered a psychological factor influencing Grade 7 learners' performance at

primary schools. Teacher attributes directly affect how learners cope and perform. If the teacher is too strict, the learners are afraid of expressing themselves and will not be responsive in class. When teachers know their content and are enthusiastic about teaching, this positively impacts the learners the learners' performance. The teacher is the main driving force behind classroom performance, as he or she is responsible for the atmosphere that prevails in the classroom, and this certainly impacts learning. Learners need to be encouraged very subtly, because they are young and at a vulnerable age. Teachers have expressed the view that the lessons learners are presented with by the educator keep their interest which greatly enhances the climate in the class. Teachers who use positive reinforcement encourage learners to work hard. The extracts from s teachers explain these. A teacher has said, that he strict and learners do not take advantage of that.

"I enjoy teaching new concepts to my learners and that is shown in my presentation" (Teacher 6).

"When the teacher is enthusiastic about the content they teach, then the learners 'pick up' on this and that makes them perform better" (Teacher 1).

"My learners love my lessons and the videos keep them entertained. Teaching methods help to maintain discipline. Mostly, they are behaved and this depends on the teachers" (Teacher 2).

"Sometimes teachers need to consider the child's situation. They need to take care of the children, looking at the situation from their perspective" (Teacher 3).

"The teachers' attitude communicates a lot to the learners; when they are confident, the learners will pick up on this and they too will be confident" (Teacher 5).

"I use positive reinforcement to reward learners and ensure that they get something like a civvies day" (Teacher 5).

"As the learners get to know teachers, they just listen and behave well. I am a strict teacher and learners do not take advantage of me" (Teacher 3).

“We are their teachers and not their friends and if we impress them from the beginning, then they will not play in our class” (Teacher 1).

4.5.1.2.2 Family issues

The responses from participants’ transcripts indicate that family relationships among the Grade 7 learners could be considered a social factor that influences their performance at primary schools. The teachers who participated in this study were aware of the family social issues, which their learners experience. There were two teachers who felt that learners were getting what they needed and thus family structural issues should not be a problem. Many teachers attested to the fact that their learners were strong in the face of these difficulties. The economic situation of the parents has a profound effect on the learners’ social background. It is the responsibility of the teacher and the school.

In light of the above, one teacher mentioned that the onsite social worker takes care of the learners with social situations the school is not able to take care of. When learners from poorer homes come to school, they get affected by the situation at home, compared to their richer peers. Teachers lamented the situation of children whose parents only take responsibility for the physical needs of their children and then leave the rest to the educator. Five out of six teachers declared that they witnessed little or no parental involvement in their child’s schooling. If parents were perhaps more involved, this would inculcate accountability within the learners. The extracts from six teachers confirm these findings.

“The family situation definitely affects learners, sometimes positively and at other times in a negative way” (Teacher 5).

“Their home life explains a lot about their performance” (Teacher 6).

“Many learners have issues at home and this often impacts their schooling. It is not always evident, but it does come up often” (Teacher 4).

“Parents feel that once the learner is in school, it is not their responsibility. They don’t want to take care of their children” (Teacher 1).

“Parents do not know their responsibility as far as their children are concerned. Parents do not know why they are sending their children to school” (Teacher 3).

“The learners get everything at school; thus, their families should not affect them” (Teacher 2).

“Some learners come from parents that are always fighting. Others have been left with grandparents and this affects them too, as their parents are far. Grandparents do not always understand the children” (Teacher 1).

4.5.1.2.3 Community issues

The responses from participants’ transcripts suggest that community issues are a social factor that influences Grade 7 learners’ performance in Mathematics at primary schools. The school is a microcosm of the larger community, and those social ills that are prevalent in the community definitely permeate into the schools. The teachers who participated in this study stated that some of the difficulties that learners face are in the communities they come from. Some of these problems are the bullying of weaker learners, and this crime comes into schools. The areas that some learners come from have stigma attached to them, and learners are often affected by that reality. Most schools provide them with food; however, this is not the only social issue that learners face. The poverty that the community experiences influence the performance of learners. One educator mentioned that the different factions of learners tend to discriminate against each other even though their differences are minor. There are different factions in one of the schools where the learners were interviewed, and these groups come into the school and disturb the harmony of the school. In some schools learners from different groupings discriminate against each other. The extracts from four teachers support these issues.

“The community my learners come from has an effect on them; some of them come from very poor communities, and this has an effect on them. They come from rough areas” (Teacher 1).

“Some learners are indoctrinated into gangs early, and this accompanies them to school. This may become more of a problem these days” (Teacher 3).

“There are many unemployed people in the community and the learners do not know that there is a better life for them” (Teacher 4).

“Our school is situated in a rough area, and these unpleasant elements sometimes come into the school. We try to find out about it early in order put a stop to it” (Teacher 2).

4.5.1.3 Academic factors

The academic factors that influence Grade 7 learners' performance in the Mathematics classroom include the comprehension of concepts, mathematical learning difficulties, language as a barrier to performance and the lack of appropriate mathematical resources.

4.5.1.3.1 Comprehension of concepts

The responses from participants' transcripts reported that the comprehension of concepts is an academic factor that influences the performance of Grade 7 learners in Mathematics at primary schools. Teachers opined that the comprehension of concepts is commonly thought to be the most challenging, as this is the inner nature of Mathematics; thus, the retention of facts can always be learnt, though learners will get to use a calculator later on. The understanding of mathematical concepts becomes easy if learners' conceptual understanding is strong. Teachers are of the opinion that if learners' foundation is not built properly, they certainly struggle grasping concepts. If they know the relationship of numbers, then the understanding will fall into place. The extracts from five teachers explain these.

“The retention of facts is problematic to them, as they do not apply themselves enough. I believe that they understand everything, but they do not have a clear understanding of the concepts” (Teacher 1).

“The retention of facts and concepts are both balanced in difficulty, some retention and others concepts. They know what numbers are. Why does it have to be difficult...” (Teacher 2).

“Strong learners understand the concepts and retain facts. Contrary, weak learners cannot do any of those things” (Teacher 3).

“When it comes to Mathematics, they can do it or not. It is very seldom that a learner has a problem. The problem is in foundation phase as the teachers there are inadequately trained” (Teacher 4).

“The understanding of concepts is important for learners; they often get calculators to deal with the retention of facts” (Teacher 5).

4.5.1.3.2 Mathematics learning difficulties

The responses from participants’ transcripts reported that mathematical learning difficulties are an academic factor that influences the performance of Grade 7 learners at primary schools. Educators have expressed their issues with mathematical difficulties because learners are exposed to educational experiences when they are young. Some of these difficulties are prevalent because the learners do not know their basics.

Teaching strategies must be modified to overcome this problem as mentioned by some teachers. These teachers felt that there are no difficulties in learning Mathematics and everyone is capable, and they just have to apply themselves. The Grade 7 curriculum has perhaps rapidly moved onto abstract teaching and very often, learners are not able to visualise what is explained to them. The teachers mentioned that concrete manipulatives should be used and consecutive numbers have been mentioned as problematic.

Learners struggle to understand very specific topics like fractions and geometry; these are more concrete type of concepts. In geometry, it is necessary that the learner be pre-exposed to certain educational games. Some teachers have mentioned that geometry is challenging for learners because they have developmental difficulties. If a learner is not at the expected developmental stage, where he can understand how these shapes can be manipulated, then they will have difficulty with 3D shapes. Two teachers said that the teaching strategies that should be used have to be adapted to the learners' level.

The extracts from five teachers support these observations. The other concept mentioned as a problem is word problems, as learners struggle with literacy. Learners do not always understand what they are reading and this becomes a problem.

“When it comes to Mathematics, they can do it or not, and it is very seldom that a learner has a problem, the problem is in foundation phase as the teachers there are inadequately trained in applying concrete teaching to smaller children” (Teacher 3).

“We need a solid foundation, which can be used all the time, even though mathematical language is different. Sometimes learners have never seen concrete objects” (Teacher 2).

“When learners are at the right developmental stage of understanding, they do not struggle with 3D because of developmental issues. They struggle with it because they have not had enough exposure to it” (Teacher 1).

“Learners have not been taught well in the earlier years and hence they struggle” (Teacher 5).

“Consecutive numbers are a problem, but when learners eventually do get the concept, then it will be too late and the concepts will be difficult now” (Teacher 4).

“Because of lack of understanding, learners always struggle with fractions. We show them step by step, but they just do not understand. They muddle

things up, cannot remember the steps, and there is a definite lack of understanding” (Teacher 6).

“They struggle to understand geometry because it is a very concrete topic; hence it is difficult for them to understand. I need to find a concrete way of teaching the concepts” (Teacher 5).

4.5.1.3.3 Teaching Mathematics in the learners’ second language

The participants reported that teaching Mathematics in the learners’ second language is an academic factor influencing the performance of Grade 7 learners in Mathematics at primary schools. Teachers reported that teaching and learning Mathematics is a complex issue, and when learners are taught in their second language, this becomes a barrier. The understanding of language as an understanding tool is important. Teachers teach in the language of the school while the learners have a different language in their home. Learners in the Frances Baard District may have their vernacular language that is different from the one used by teachers, and this may negatively impact their learning. There are teachers who expressed the desire to know more about their learners, and thought that if they knew more, maybe they could reach more learners. One of the educators felt there was no need for culture and rather considered it an issue to be kept out of the class. The educator said:

“There is a language barrier. Learners do not understand me. If the child does not know, they must be taught in their first language. Language is a big barrier...” (Teacher 4).

“Maths is not easy for them when teachers teach learners in their second language. Since they have come from the bases of being taught in their home language, they understand the basics and when I start teaching them in English, they do not have any problems” (Teacher 2).

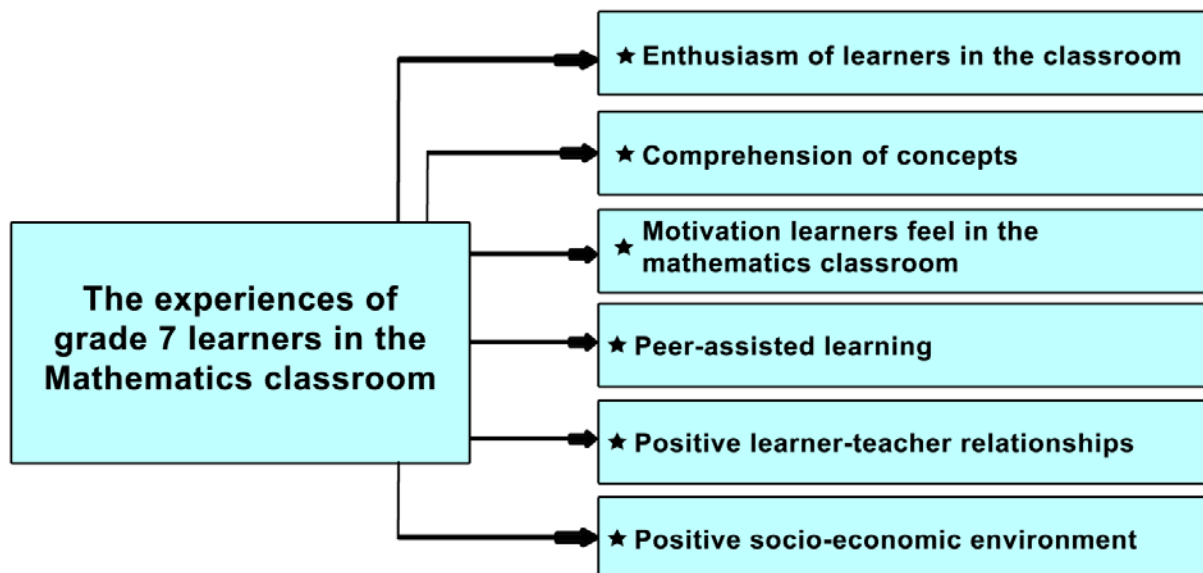
“They’re not taught in their home language, and this is a huge problem. I am not familiar with their culture at all. That is definitely not enough. If I knew more about them, then maybe I could reach more learners.” (Teacher 6).

“Learners are not taught in their home language, and this is a problem. If we could have taught them in their home language, it would be a great advantage for us” (Teacher 3).

4.5.2 Experiences of Grade 7 learners in Mathematics in relation to their results when they reach the Senior Phase

This study revealed that Grade 7 learners experienced enthusiasm, comprehension, motivation, peer-assisted learning, positive teacher relationships, and a positive social environment in their Mathematics classroom in the Frances Baard District.

Figure 4.2: The experiences of Grade 7 learners in the Mathematics classroom.



4.5.2.1 Enthusiasm that learners experience in the Mathematics classroom

The responses from participants’ transcripts showed the enthusiasm that Grade7 learners experienced in Mathematics. Learners have expressed a feeling of interest when it comes to the time they spend in the Mathematics classroom. They are

interested in learning new concepts and furthering their future endeavours. Learners explained that they had interest in Mathematics because their teacher was enthusiastic. Teacher interest and enthusiasm positively affect performance. Learners expressed the notion that their future would be bright if they had Mathematics as a subject that influenced the career path they have chosen. Learners felt that Mathematics is interesting to them because they discover new things or build on what they already know and can explore the concepts and go deeper. They indicated that Mathematics gave them the opportunity to feel smart and important. They also said it gives them a form of strength and confidence in their ability to prosper academically. Learners felt that Mathematics challenges learners, thus stimulating their growth and interest. Learners showed the profound enjoyment they received from learning Mathematics. The extracts from six learners express these sentiments.

“I do not have any specific feeling, but Mathematics is always interesting and enjoyable” (FGD1; Learner 1).

“I am happy to be in the Maths class. Our teacher is never absent, and Mathematics lessons always keep us busy with our work” (FGD 2; Learner 1).

“I love Maths because I want to be an engineer. My teacher supports us and makes sure that we learn. We always had a good experience when we learn Mathematics” (FGD 2; Learner 3).

“...and this makes for interesting class” (FGD 2; Learner 3).

“I am always happy to come to Maths as it very interesting, and there is always a challenge” (FGD 3; Learner 1).

“I enjoy Maths and our teacher is very funny, and his lessons are always interesting” (FGD 3; Learner 4).

4.5.2.2 Comprehension of concepts

The responses from participants' transcripts showed that Grade 7 learners experience comprehension in Mathematics. The learners expressed feelings of excitement, which means they looked forward to learning. They associated the subject with overall happiness because they understand the topics. Learners felt that the relationship they had with their teachers changed the attitude they had when they came to class. When the learners are excited, it means that they look forward to what they are being taught. They expect to be challenged in the Mathematics class. Learners expressed excitement at being taught something new. When learners know that they are doing well, they also get excited as this means that they are succeeding. Some of the excitement comes from learning and knowing that they are moving forward and achieving their goals. Coupled with this excitement is the feeling that doing mathematics entails a feeling of intrigue, when all is well and they are achieving their goals and doing what they are supposed to and achieving their goals. When learners understand something and are able to solve complex problems, it gives them feelings of happiness and elation at achievement. Learners' experience of excitement means that they understand the concepts even though Mathematics is seemingly problematic. The extracts from eight learners express these sentiments.

'I love Mathematics because it is easy and interesting once you get to know it. When I know the concepts, then it makes me feel above the clouds' (FGD 4; Learner 3).

"We do not have any problems in Maths; there are new concepts that we do not always understand quickly, but these are very few, and the teacher explains them to us" (FGD 1; Learner 1).

"Mathematics had always been easy for me. I had the same teacher and I did not struggle at all" (FGD 2; Learner 4).

"The more the concepts were taught, the lesser we struggled" (FGD 2; Learner 5).

“When I have understood, I always feel so happy. I get that feeling of excitement when I understand something. I always feel proud when I get to know Mathematics” (FGD 3; Learner).

“I love Maths, and this year it is more fun because it is like a puzzle that we can solve” (FGD 6; Learner 3).

“Math is easy, and I don’t feel any stress. It is always interesting when you can solve the problems in many ways” (FGD 4; Learner 4).

“I feel clever when I leave the Maths class; I know I can solve a difficult problem” (FGD 5; Learner 1).

4.5.2.3 Motivation that learners feel in the Mathematics classroom

The responses from participants’ transcripts showed the motivation experienced by Grade 7 learners in the Mathematics classroom. Learners feel intrinsically motivated to be in the Mathematics class. This is an important factor that relates to full understanding of the concepts. If learners are in class, they are motivated by what they feel there. They are also motivated by the knowledge that they know Mathematics. Learners felt that they wanted to be successful. Learners’ motivation is enhanced by their relationship with their educators. Learners expressed that the educators made them feel good about themselves, and in the process, the learners are motivated to work harder. There are learners who are motivated by their future dreams and plans. This motivates them, because if they work hard in Mathematics, then they will be successful and achieve their dreams. Learners realised that when they work hard, they will be successful, and this in itself is a form of motivation for them. When Mathematics is not a problem for them, they have a sense of knowing and this is a motivation for them. Learners that feel good about their achievements, or comprehension, often feel motivated to do better. The extracts from eight learners express the same sentiments.

“I know what I want to do, and this is my motivation” (FGD 2; Learner 4).

“My teacher is good with me; I always work with a group of good friends” (FGD 1; Learner 2).

“The teachers were always patient and we did not experience any problems” (FGD; Learner 3).

“Our teacher thinks we are clever; this motivates us” (FGD 2; Learner 2).

“I love Maths because my teacher is nice, and she always makes me feel appreciated and I feel clever when I leave the Maths class. I know I can do a difficult problem” (FGD 5; Learner 1).

“I know that I feel good, when I have understood it” (FGD 5; Learner 2).

“We just had a good experience. I only started understanding Maths in the Grade 5 class. I understand Maths and this is not a problem for me” (FGD 2; Learner 3).

4.5.2.4 Peer-Assisted Learning as a positive experience for learner

The responses from participants' transcripts showed peer-assisted learning a positive experience for Grade 7 learners in the Mathematics classroom. There are learners who continually work with their friends in class, assisting each other. Learners showed that they could work together in groups, and whatever they miss while the teacher is explaining, they peer-teach each other. Learners felt that when they work in groups then it is not always the stronger that do better; everyone gets an equal chance. Learners enjoy working with their friends. The extracts from 6 learners demonstrate these sentiments.

“My friends behave themselves in class. They listen and do their work; this means that our class is in a good state; we learn altogether with my friends” (FGD 2; Learner 3).

“I have a good group of friends we always work together” (Group 1; Learner 2)

“We work in groups and those that are stronger than others always assist us; so we all learn” (FGD 3; Learner 4).

“We sit together in our groups solving the mathematical problems; it is not always the clever learners that get the answers because we work together” (FGD 4; Learner 4).

“My peers are not a problem. We help each other in learning; we sit together and work on the problems, and this helps us” (FGD 4; Learner 1).

“If I get stuck, I ask a friend to help me” (FGD 3; Learner 1).

4.5.2.5 Positive learner-teacher relationships that enhance the learning environment

The responses from participants’ transcripts showed positive learner-teacher relationships as being experienced by Grade 7 learners in the Mathematics classroom. The relationship that learners have with their teachers is a main factor that impresses a positive learning experience. Learners felt that the perception that teachers have of their learners is important in how they approach their classes and how they adapt to teaching the learners. Learners confessed that when their teachers loved them and had time for them, they excelled academically. Learners also expressed their appreciation of stricter teachers who keep control of the class as this hugely promotes learning. Learners want the class to be calm and engaged while learning, as they felt this makes the classroom environment a better one. Learners said that they liked teachers with whom they are familiar, thus making them feel happier and more successful. Learners who had the same teacher for Grades 6 and 7 seemed happier as they were already used to their teacher. Teachers who are patient with learners teach better and learners feel good about their Mathematics experience. The extracts from eight learners express these findings.

“My teacher is good with me” (FGD 1; Learner 2).

“I love my Maths teacher; she makes us work” (FGD 1; Learner 3).

“My teacher is always there and willing to teach. He is very strict, but he is also very interesting” (FGD 2; Learner 2).

“I am happy to be in the Maths class. Our teacher is never absent, because of this, we do not have any problems in maths” (FGD 2; Learner 1).

“My teacher is supporting us and making sure that we learn; we just had a good experience” (FGD 2; Learner 3).

“I had the same teacher and I did not struggle at all, the same teacher taught us and prepared us for Grade 7” (FGD 2; Learner 4).

“I enjoy Maths, and our teacher is very funny, and his lessons are always interesting. He makes jokes and it is always good to listen to him” (FGD 3; Learner 4).

“I love maths because my teacher is nice; she always makes me feel appreciated” (FGD 5; Learner 1).

“Our teacher thinks we are clever. She teaches us well and we do not have difficulties like learners in other schools” (FGD 6; Learner 2).

4.5.2.6 Positive socio-economic environment

The responses from participants' transcripts showed a positive socio-economic environment as a good experience for Grade 7 learners doing Mathematics. Learners showed that they had a safe environment that adds to their well-being. Learners expressed the need for a place where they can do their homework. Learners said parents made their homes conducive to learning, even if they did not have all the amenities. They were happy and comfortable in their homes. Some learners expressed appreciation for the space that has been created for them, along with their siblings where a learning environment has been created. Another learner expressed her pleasure with the presence of a sibling. A learner mentioned that even though she lived with her grandmother, she was well taken care of, and her grandmother supported her, through her studies. The extracts from eight learners express these sentiments.

“Everything at home is fine; we do not have problems. We just have a normal house and we can learn and do our homework” (FGD 1; Learner 1).

“I do not have problems at home. We have everything we need for school. I do work very well with my siblings” (FGD 6; Learner 1).

“I do not have issues at home, I live with my grandmother and siblings, but we all work together” (FGD 6; Learner 2).

“We do not need anything right now; my parents have given me everything they can” (FGD 2; Learner 3).

“My parents don’t put too much stress on me. They let me do my work. I work with my siblings and cousins in a group” (FGD 4; Learner 3).

“We have enough food and do not experience difficulties that will hamper my studies” (FGD 3; Learner 3).

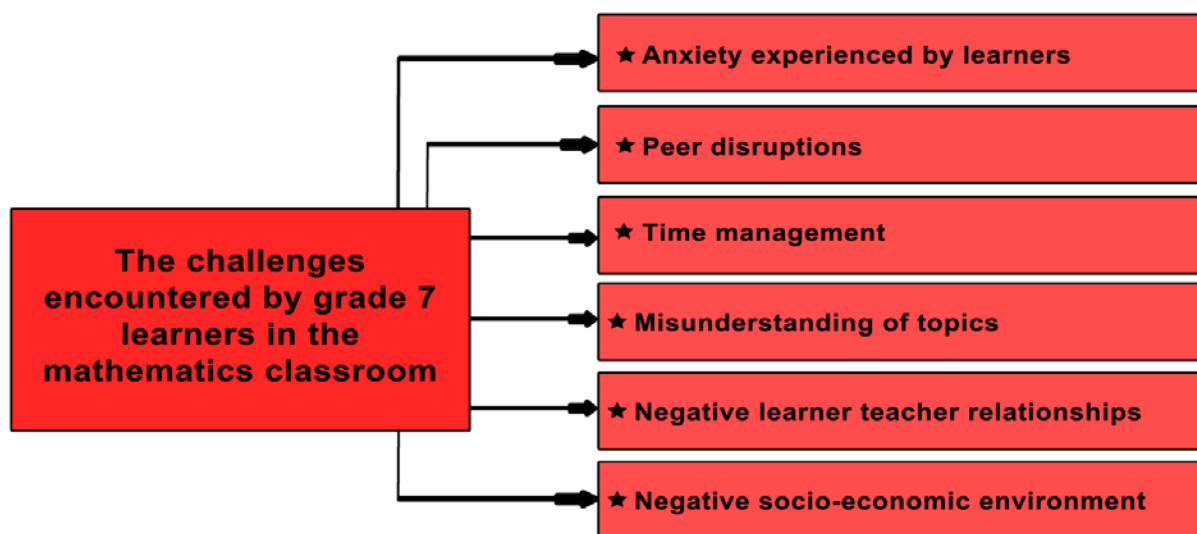
“I have a sister that helps me at home. She helps with most chores” (FGD 3; Learner 3).

“My grandmother helps me a lot; she takes me to intervention classes, because she thinks that I cannot go alone” (FGD 5; Learner 2).

4.5.2.7 The challenges Grade 7 learners encountered in Mathematics

This study showed that Grade 7 learners encountered various challenges in Mathematics in the Frances Baard District. These include anxiety, peer disruptions, time constraints, misunderstanding of complex topics, negative learner-teacher relationships, and shortage of learning resources, external distractions, and a negative socio-economic environment.

Figure 4.3: The challenges encountered by Grade 7 learners in the Mathematics classroom



4.5.2.8 Anxiety experienced by Grade 7 learners in the Mathematics classroom

The responses from participants' transcripts showed anxiety as a challenge facing Grade 7 learners in the Mathematics classroom. Learners expressed anxiety that is caused by the stress that many a learner experiences when he is faced with the prospect of attending a Mathematics class. Learners who accepted their problems with maths expressed anxiety. It may be that the Mathematics classroom setting is not suitable for the learner and thus causes him stress. Learners have expressed the wish to stay at home and work, and at the same time expressed concern over social issues. Learners showed anxiety towards assessment and the looming prospect of failing an exam contributes to the feelings of anxiety and stress for learners. Learners feel fear for the subject and this fear could be a leading factor to anxiety. New concepts cause learners to feel anxiety. A new concept may mean that they will not understand the first time around. Timed tests always give learners stress as they may not be able to finish a test on time and this may cause them to fail. This means they have to spend extra time on the topic. Learners felt stress in the beginning of the term,

there is always a degree of stress involved as learners get used to the idea of a higher standard and a new teacher, once they adapt and get used to it. Learners have negative feelings associated with Mathematics, the reasons of which could be many, some of them mentioned by learners and teachers alike because of past experiences or even incidents that have happened in the mathematics class. Some learners have issues coming into Grade 7, their issues are coming from Grades 5 or 6 and this is a big problem, as they cannot be taught work from previous grades in the class. These feelings are not always positive ones and this is a problem for the performance of learners. The extracts from eight learners express these.

The responses from participants' transcripts showed anxiety as a challenge facing Grade 7 learners in the Mathematics classroom. Learners expressed anxiety that is caused by the stress that many a learner experiences when he is faced with the prospect of attending a Mathematics class. Learners who accepted their problems with maths expressed anxiety. It may be that the Mathematics classroom setting is not suitable for the learner and thus causes him stress. Learners have expressed the wish to stay at home and work, and at the same time expressed concern over social issues. Learners showed anxiety towards assessment and the looming prospect of failing an exam contributes to the feelings of anxiety and stress for learners. Learners feel fear for the subject and this fear could be a leading factor to anxiety.

Further, new concepts cause learners to feel anxiety. A new concept may mean that they will not understand the first time around. Timed tests always give learners stress as they may not be able to finish a test on time and this may cause them to fail. This means they have to spend extra time on the topic. Learners felt stress in the beginning of the term, there is always a degree of stress involved as learners get used to the idea of a higher standard and a new teacher, once they adapt and get used to it. Learners have negative feelings associated with Mathematics, the reasons of which could be many, some of them mentioned by learners and teachers alike because of

past experiences or even incidents that have happened in the mathematics class. Some learners have issues coming into Grade 7, their issues are coming from Grades 5 or 6 and this is a big problem, as they cannot be taught work from previous grades in the class. These feelings are not always positive ones and this is a problem for the performance of learners. The extracts from seven learners express these.

"I prefer to stay home. I wish I could learn online. It would be nice, but also I would miss my friends" (FGD 1; Learner 4).

"Maths is difficult for me; I feel like failing all my Mathematics tests" (FGD 3; Learner 2).

"Maths gives me stress, but I need to study what I need; so even if I have stress, I will still do it" (FGD 3; Learner 3).

"I feel scared, and that is not a good feeling as it makes feel stressed" (FGD 5; Learner 2).

"I think when it comes to tests, there is not enough time for us, and I don't always finish my test" (FGD 4; Learner 1).

"Mathematics is stressful. I always feel like I am going to miss something; Numbers make me feel stressed" (FGD 4; Learner 2).

"...but when there is something new... then I stress... sometimes I will panic" (FGD 5; Learner 3).

4.5.3.2 Peer disruptions in the Mathematics classroom

The responses from participants' transcripts showed peer disruptions as a challenge that Grade 7 learners experienced in the Mathematics classroom. Learners experience some frustration when they are faced with obstacles that hamper their learning, such as other learners causing disruptions in the class. Disrespect for the teacher that causes an unpleasant atmosphere in the class, which is often not conducive to learning. The learners do not always understand what the teacher says and this causes some feelings of frustration for the learner, as they are in the class,

but feel like they are missing out on important work. Learners do not always understand the teacher because they are not all on the same level, and this causes some problems, as the teacher does not have the time to reteach the lessons. Those learners who are not on the same level are the ones causing the disruptions. Learners at this time do not understand because of the disruption caused in the class by the other learners. Learners in the class disrespecting the teacher causes frustration as the learner who wants to learn is unable to learn, this becomes a problem and causes a drop in the performance of the learners in the class. The position where a learner sits in the class makes a difference to the learning of the lesson. The learners who are disruptive always sit at the back of the class. The extracts from six learners express these.

“My classmates are my only issue. I don’t think I have other problems. They cause disruptions and this is not good for the class, as we do not know what is going on in the class” (FGD 6; Learner 1).

“When the learners don’t listen, it will mean we don’t hear the teacher and then we don’t understand; this is a serious problem” (FGD 5; Learner 3).

“The main issue for our group is the discipline of the learners; some friends do not understand the teacher and make funny sounds, it is very annoying and they do not want to take responsibility for their actions” (FGD 5; Learner 1).

“My peers do not respect the teacher, especially the boys. They do not behave. They become jealous when I get good marks” (FGD 1; Learner 1).

“...and the other children do not always allow her to explain again” (FGD 1; Learner 3).

“The other learners in my class do not always listen to the teacher and they make her angry and upset” (FGD 1; Learner 4).

4.5.3.3 Time management

The responses from participants’ transcripts showed management as a challenge for Grade7 learners in the Mathematics classroom. In the teaching and learning of

Mathematics, time is always of essence. Time to teach is important and equally important is the time that the learners spend with their work. Learners accepted that they had time constraints in the form of enough time with their teachers as well as sitting down and consolidating their understanding of the concepts. The learners also mentioned that they had to spend time on the retention of facts as this is vital for their success. Learners felt that they do not have adequate time management skills, as the subject needs time and when they did get the time during COVID-19, they did not know how to manage it and much of it got wasted in futile activities and their schoolwork still suffered. Time is wasted on the discipline of peers and this is also a problem for learners as many of them, need extra time on a topic. When the peers aggravate the classroom circumstances this becomes a major issue for learners. The extracts from five learners express these.

“The time we have with our teacher is too little, which means that we do not always get our work done, and when it is the next period, we have other work to do” (FGD 4; Learner 1).

“Maths needs more time, during COVID-19 we got enough time to work, but it also made me lazy... because now we have too much time, which is getting wasted” (FGD 4; Learner 2).

“I am afraid to ask my teacher again. As I know she does not have the time to do the same work again” (FGD 4; Learner 3).

“Other obstacles are that I cannot concentrate enough; I need to sit with my work, and this takes some time for me” (FGD 6; Learner 1).

“I would appreciate more time though” FGD 4; Learner 4).

4.5.3.5 Negative learner-teacher relationships

The responses from participants' transcripts showed negative learner-teacher relationships as a challenge for Grade7 learners in the Mathematics classroom. Learners who had a negative relationship with their teachers struggled more, and this had a negative impact on their performance. Teacher expectations is a problem, when

the teacher expects too much from learners, this becomes a form of anxiety for the learner. There are also learners who feel anxious about their classroom situations, the attitude of some learners in the class and the characteristics of the educator is an impeding factor for learners. They do not always have a good relationship with their teachers. The learners' ill-discipline results in the aggravation of the teacher and this contributes to the lessons not being carried out properly.

Teaching strategies were mentioned as a hindrance by one learner. Some learners do not have actual issues with their teachers, but they do feel shy to approach the teacher due to peer pressure. Some teachers do not have a positive social relationship with learners, and some learners feel that if they did make an effort to get to know them better, it would make a difference to their learning. Learners have expressed the need for a more social relationship with their teacher, maybe if he knows them as people it may make all the difference in how they perceive the subject, this could be a factor that enhances their performance in the class. The extracts from six learners express these.

"He comes and teaches us and leaves. He does not talk to us; he is very boring" (FGD 4; Learner 4).

"The teacher expects too much from us; we cannot always understand her" (FGD 4; Learner 2).

"Sometimes she talks so fast that I get lost in the words" (FGD 5; Learner 3).

"The other learners in my class do not always listen to the teacher and they make her angry and upset, it is difficult to be in the class" (FGD 1; Learner 3).

"My relationship with my teacher is not good; She has favourites" (FGD 1; Learner 1).

"Yes, maybe if we could have a more friendly relationship then we could do better. It is difficult for me to understand her" (FGD 4; Learner 3).

4.5.3.6 Shortage of learning resources

The responses from participants' transcripts showed a shortage of learning resources as a challenge for Grade 7 learners in the Mathematics classroom. There were only two resources that learners expressed a need for; one is the use of a textbook and the other is the use of technology. The textbooks cannot be given to learners because they have a problem looking after the books and schools do not have access to computers and this makes learning a bit boring though not impossible. Having computer-assisted learning would enhance the learning environment, but it does not necessarily remove the obstacles that learners experience. Teachers did not express the need for textbooks, although learners did. According to teachers, textbooks are not needed as teachers usually make copies and give learners activities; this means that they do have work and explanations of relevant topics. The extracts from five learners express these.

"I would like to have a text book we can work from" (FGD 1; Learner 2).

"We do not have text books, but we have copies of notes and it is clear and understandable" (FGD 2; Learner 2).

"We could also do with some computer programs... that will be nice, and maths will be fun, it can be very boring" (FGD 3; Learner 3).

"If we had text books it would be easier, the copies are not always clear, and sometimes we miss the copies if we are absent especially now in COVID-19" (FGD 5; Learner 4).

"Before COVID-19 the learners did not look after the books, so the school cannot give us books" (FGD 5; Learner 3).

4.5.3.7 Negative socio-economic environment

A negative socio-economic environment means that learners have issues to deal with at home that negatively impact their learning. Among these issues are the responsibility of looking after siblings. Often parents are working late, or out of town

as the Frances Baard District is not a major city. When parents work late, it is difficult for them to take proper care of children. Thus, learners are living with grandparents or guardians, not always taking total care of their social and emotional needs. Sometimes these situations are not ideal for learners, and causes some difficulty for them, impacting their performance. The geographical location of learners' residences is an issue, because some of them are living in rough areas, and are faced with unpleasant situations impacting their academic performance. There is a situation, when there are extra family members living with learners and who do not fully support learners academically, this too has become a factor that results in the decline of in learners' performance. The extracts from five learners express these.

"I always have to take care of my siblings, and that is sometimes difficult for I have to give them food" (FGD 1; Learner 2).

"My parents come from work late. My mom is a nurse and this makes it difficult for me" (FGD 1; Learner 3).

"... Yes, there are many children in my house and they bother me when I have to do my homework" (FGD 2; Learner 1).

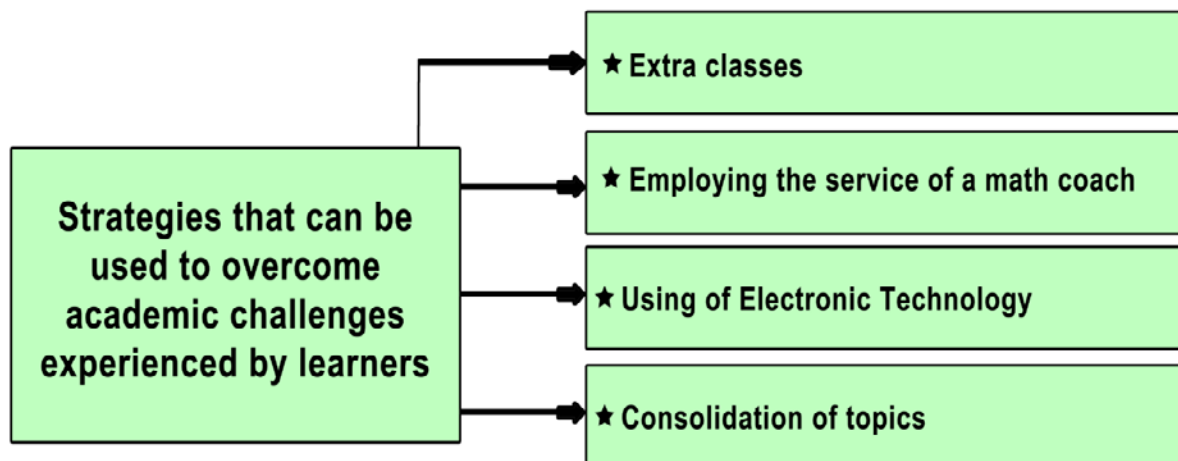
"I have an aunt that lives with us, and she does not share her things with our house. We are many in the house. We have to share a lot and they like to fight with each other" (FGD 3; Learner 2).

"Sometimes the neighbours fight and this causes a lot of noise in my street. We live in a busy area, and this is not always the best for us" (FGD 3; Learner 2).

4.5.4 Teachers' intervention strategies improving the Grade 7 learners' performance in the Mathematics

This study showed that using extra classes, employing the services of a math coach, using electronic technology, using manipulatives to teach complicated topics, and consolidation of concepts could be considered as intervention strategies to improve the Grade 7 learners' performance in schools in in the Frances Baard District.

Figure 4.4: Strategies that can be used to overcome academic challenges experienced by learners.



4.5.4.1 Using of extra classes

The responses from participants' transcripts describe the using of extra classes as an intervention strategy that can be used to enhance the Grade 7 learners' performance in mathematics. Extra classes are done when the teacher evaluates an assignment and finds constant errors that learners make. She then finds ways of remediating these difficulties for the learners. Extra classes are done in the form of classes conducted after school with a small group of learners. There are teachers who do internal intervention, which means they do it during normal teaching hours. If learners struggle with a concept, they address it during class time. The time that intervention is carried out is important, as this has an impact on the success or failure of the action. The time normally set aside for extra classes is after school; this is also sporting time for learners, and thus the learners do not give their full attention to the class. It is important for teachers to detect problems early on in the year. Teachers have expressed that by the time a learner reaches grade seven the problems are not repairable, and would require intensive intervention that cannot be carried out in the same year, and will cause a decline in performance. The extracts from six teachers explain these issues.

"We check what they don't know and then carry out intervention from there. Accordingly, we do extra classes" (Teacher 1).

"Intervention is for those learners who do not understand the first time around, we have to go back and see what we are doing wrong... maybe find another way of getting the learners to understand" (Teacher 5).

"Extra classes are needed to fix the problems, with some learners, I put them in groups, they then sit with other learners who can help them and this makes up for what they do not understand" (Teacher 6).

"We do intervention during class. I re-teach the same lesson in a different way, during class time. I do not do extra things" (Teacher 4).

“It will be good if they go online and look at extra classes, they can do there” (Teacher 3).

“Challenges should be addressed early. If we do not catch them early enough, by the time they come to us, they already have a problem” (Teacher 2).

“We give thirty minutes after school to teach different concepts” (Teacher 3).

4.5.4.2 Employing the services of a math coach

The responses from participants’ transcripts describe the employment of math coaches as an intervention strategy that can be used to enhance the performance of Grade 7 learners in Mathematics. Schools in the Frances Baard District have state-employed math coaches. Three of the teachers mentioned that their math coaches helped learners cope with class activities. The Maths coaches, with the guidance of the teacher, take learners in small groups or on an individual basis and assist them in understanding the concepts they struggle with. This has proven to be an effective strategy in helping learners perform better in Mathematics. Schools in the Frances Baard District have state-employed math coaches. Three of the teachers mentioned that their math coaches help learners grasp the concepts taught. While the teacher is teaching, the math coach walks among the learners in the class and checks on what learners are busy doing, and corrects them to ensure they understand what is expected of them. The Maths coaches have the ability to work with learners on an individual basis, assisting them deal with the problems they are experiencing. Maths coaches are also trained to contact extra classes; sometimes a learner understands the teacher, but just needs some help to consolidate the acquired knowledge and this is where the math coach intervenes. The extracts from three teachers explain these.

“We have teachers’ aides who are trained to help learners cope with the concepts they struggle with and this makes a big difference” (Teacher 1).

“We have a math coach in class and while I am teaching, he or she assists learners grasp some concepts. I work with the coaches and this helps a lot as we devise ways of helping learners” (Teacher 2).

“We have class assistants and that has significantly helped learners. In Grades 5, 6 and 7 the support they get is offered after classes (Teacher 6).

4.5.4.3 Upgrade to electronic technology in the Mathematics classroom

The responses from participants' transcripts describe the upgrading of pedagogical approaches to electronic technology as an intervention strategy that can be used to enhance the performance of Grade 7 learners in Mathematics. Teachers felt that parents have access to devices and technology, which are capable of addressing barriers in the teaching and learning of Mathematics. This strategy involves use of computers programmes available online. Some teachers have access to programmes like e-classroom and this has been used as an intervention strategy. Teachers said that the intervention is also beneficial as it is play-based and there is an element of enjoyment added to the intervention. Teachers felt that it is convenient as it can be done at any time suitable to the learner. A teacher said that the world is changing; hence, learners should have access to all types of learning. Teachers advocated the need to upgrade the education system. All forms of learning take place on the internet. Learners spend much of their time surfing the internet and using digital technology; hence, it would be good for them to make use of this ability to enhance their marks in Mathematics, and improving their performance. Technology is in everything that contemporary learners use. However, in our schools, we are slow to integrate technology in our classes. Teachers have expressed the need for the schooling system to be upgraded technologically. This is a vital strategy that teachers can use to improve the performance of learners in a Mathematics classroom. The extracts from four teachers explain these findings.

“If we had access to computers and all such things, maybe this would make a difference to the learning that happens in the classroom” (Teacher 4).

“I have shared website links with my learners in the beginning of every lesson to allow them to research for more content and practise at home on the work taught in class” (Teacher 6).

“It would be nice for the education system to upgrade to the level of the learner in this century” (Teacher 5).

“Everything in the world is computer-based today, but we are still using the chalkboard and this is holding the learners back” (Teacher 2).

4.5.4.4 Learner-centred teaching

The responses from participants describe the use of learner-centred teaching as an intervention strategy that can be used to enhance the Grade 7 learners' performance in Mathematics. Teachers indicated that Grade 7 learners are not fully developed and the use of concrete models to teach Mathematics is useful. Learners can physically see what the teacher means when she shows them, for instance, a box representing a 3D object. The use of nets (a 2D shape that makes up a 3D shape) is needed as this shows where the 3D shapes originated. Teachers said that using manipulatives is project-based and this enhances learning and brings the concepts into context. Consecutive numbers are taught using the base ten blocks and this occurs in Grades 4, 5 and 6. It was also mentioned that when learners eventually understand, they have already lost much time. The extracts from six teachers explain these.

“In Grade 7, I still use manipulatives. Nets and 3D shapes have to be used. When they see objects, they understand things differently. We got counters called manipulatives to help learners cope with the concepts” (Teacher 2).

“It is concrete, and if they are struggling, they are being taught abstract concepts, whereas physical teaching is important” (Teacher 4).

“They struggle with concepts because they do not have a basis. They do not play with concrete stuff; hence, their development is stunted” (Teacher 6).

“Learners struggle to read word problems and they struggle with concrete things and fractions” (Teacher 5).

“Young teachers have other ways of getting to the learners. They use manipulatives and some of these strategies work really well and sometimes the learners need this” (Teacher 3).

“They have to find their own niche. We can take them to the water, but we cannot make them drink. Mathematics needs practice and more practice” (Teacher 1).

4.6 Conclusion

This chapter has discussed the results of the interviews and the opinions of teachers regarding the reasons why the learner’s performance declines. The psychological factors (those intrinsic factors that affect learners) and the emotional issues were reportedly caused by environments and situations that learners find themselves in. The study has also considered the opinions of learners regarding their experiences and challenges. The biographical details were taken by the researcher to become familiar with the participants.

Strategies that the teachers can use to improve the performance of learners in the mathematics classroom included intervention, when teachers evaluate the knowledge of learners, and find that they have a problem in a certain area.

If learners like their teachers and peers, then they will be encouraged to work harder and if not, then the opposite will happen.

The last set of factors that was explored is the experiences of the learners in the study. The learners’ own experiences and feelings were recorded.

CHAPTER 5: DISCUSSION OF FINDINGS, RECOMMENDATIONS AND SUMMARY OF THE STUDY

5.1 Introduction

Chapter 5 briefly summarises the findings of the study, outlines how the fieldwork was carried out, and describes the theoretical framework and data analysis methods used in the study. It also outlines the method that was used to find the themes that emerged from the study. It presents the findings emerging from the data and proffers the recommendations that should be adopted by educators to improve Grade 7 learners' results. The discussion also encompasses a brief summary of the interviews held with learners and teachers and the situations affecting both parties. It presents the factors that affect the performance of learners. It ends with the recommendations and conclusion deriving from the study.

5.2 Discussion of findings

This study has found the factors that influence the performance of Grade 7 learners in Mathematics in the Senior Phase. The factors were divided into three categories, thus psychological factors, social factors, and academic factors. Psychological factors include learner resilience, learner enthusiasm, learner disengagement, learner anxiety, and behaviour of the learners in the class as well as learner confidence. The social factors included school issues, family issues and community issues. School issues fall into two categories, peer relations and learner-teacher relationships. The academic factors are comprehension of concepts, mathematical learning difficulties and teaching Mathematics in the learner's second language. The experiences of Grade 7 Mathematics learners are; enthusiasm of learners in class, comprehension of

concepts, mathematical learning difficulties and teaching mathematics in the learner's second language. The challenges that Grade 7 learners encountered in the Mathematics classroom was the third objective. The themes that emerged are anxiety experienced by learners, peer disruptions, time management, misunderstanding of concepts, negative learner-teacher relationships, shortage of learning resources and a negative socio-economic situation. The strategies that teachers can use to overcome academic challenges experienced by learners include; they are extra classes, employing the services of a math coach, using of electronic technology and learner-centred teaching.

RESEARCH QUESTION 1: What are the factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase?

5.3 Psychological factors

5.3.1 Learner resilience

This study found resilience as a psychological factor that could influence the performance of Grade 7 learners in Mathematics at primary schools. Learners showed resilience despite the difficulty they went through. They worked hard and accepted responsibility for their learning. Learners were happy in the class and they displayed their happiness by doing what was expected of them. Teachers professed that despite the difficulty that learners have undergone in this period of COVID-19, they still remain positive and maintain their psychological balance. Resilience has been termed as the ability by learners to be successful, despite having gone harrowing conditions (Sandoval-Hernandez & Bialowoski, 2016; Hutauruk & Priatna, 2017). If a learner possesses resilience, they will be able to persist through complex mathematical issues (Hafiz, Darhim & Dahlan, 2017). A problem that exists in African countries, is the shortage of food, however this is not the case for schools, as learners in schools receive food (Shayo & Lawala, 2019). Learners in African countries display resilience

in the face of academic difficulties. Teachers in this study said that learners persisted through a problem, until they have mastered it. However, one teacher compared previous learners and said that her learners do not have the resilience that previous learners used to have.

5.3.2 Learners' enthusiasm as displayed in the classroom

This study found that learners' enthusiasm displayed in the classroom as a psychological factor that could influence the performance of Grade 7 Mathematics at primary schools. The learners' enthusiasm shown in the classroom displays how successful learners are. This study found that the enthusiasm that learners come to class with shows their satisfaction; coupled with this is the happiness the learners express, showing their willingness to be in the Mathematics classroom. A learner who fully engages in the class displays enthusiasm. It has been established in a study done in Tanzania that learners' enthusiasm is enhanced when they are interested by means of technology (Uchidiuno, Yarsebinski, Keebler, Koedinger & Ogan, 2019). Successful learners show the enthusiasm to be in the mathematics classroom. An Iranian study supports the notion that the classroom environment is responsible for learner enthusiasm that manifests in the classroom (Khajavy, Macintyre & Elyas, 2017).

5.3.3 Disengaged learners

This study found disengagement of learners as a psychological factor that could influence the performance of Grade 7 learners at primary schools. Learners display unhappiness by being disengaged in the classroom. They show anger at the slightest provocation; they also show violence towards their peers and their environments. Sometimes, learners are not apparently disengaged, but their results show that the learners are not working. They are not on the developmental level where they can clearly express their feelings; thus, they end up showing their feelings by acting out,

and by being disengaged. Here, disengaged here means they will not behave badly, rather they are simply disinterested in what they are being told. Contrary to all the above, there is one result that shows learners who are busy working, showing results. When learners in the class are disengaged this means that their work will suffer and their performance will be hampered (Engels et al., 2019).

5.3.4 Learner anxiety

This study found learner anxiety as a psychological factor that could influence the Grade 7 learners' performance in the Mathematics classroom at primary schools. Anxiety involves the learners expecting something bad to happen to them. Learners that participated in this study had some form of anxiety in the Mathematics classroom. Some learners felt a degree of anxiety being caused by COVID-19. This study has shown that there are learners who get sick from the anxiety they experience. The pressure that learners receive from teachers and from their parents with regard to Mathematics is a factor contributing to the anxiety that they experience. Teachers are responsible for the anxiety that learners experience in the classroom (Segumpan & Tan, 2018). "Brain science" proves that when learners are under pressure and stress, their brain function is not at the best, due to the anxiety they experience (Boaler, Muson & Williams, 2019). Learners who struggle with Mathematics experience anxiety due to the inability to understand the concepts.

5.3.5 Behaviour of the learners in the classroom

This study found the behaviour of the learners in the classroom as a psychological factor that could influence the performance of Grade 7 learners in a Mathematics classroom at primary schools. Learners do not outwardly show disrespect for teachers; rather, they sometimes show their dissatisfaction in very subtle ways. They act it out by scoring substandard results. Some learners just sit quietly throughout the lesson and then ask a friend for help later on. Such learners seldom misbehave. The teachers

that participated in this study were experienced and that experience gives them the upper hand without the use of corporal punishment or any other forms of discipline they manage to control the classroom. A study supported this by reporting that the teacher is the main manager of the classroom environment, thus controlling learners' behaviour (Tran, 2015). One teacher with more than 25 years of class teaching experience said, "I wish they were really as behaved as they seem, because their results show that they do not actually understand what is going on in the class". When learners were exposed to the idea that they "can" do Mathematics, this changed their performance in Mathematics too (Boaler, Muson & Williams, 2019). Teachers in this group of participants all mentioned that learners are struggling to cope with everyday issues in the class. The behaviour that learners display depends on the teacher's competence.

5.3.6 Learner confidence

This study found learner confidence as a psychological factor that could influence the Grade 7 learners' performance in Mathematics classroom at primary schools. Learners' confidence is linked to their performance; this is a major factor that impacts the learners' performance. There are several factors that can be attributed to learners' confidence in the class. These attributes include academic success, personal history and even individual differences (Wentzel & Miele, 2016). The participants in this study alluded to this too, that their attitude and attributes in the class have a direct effect on the learners' performance. Learners who showed confidence put more effort into their work, and this in turn enhances their performance (Velayutham & Aldridge, 2013). The link between what learners think of themselves and their performance is a factor that highly affects the performance of learners in Mathematics. Learner confidence increases when they have adopted the skill needed in the classroom (Bernales, 2016). This study found that the mindset that learners have in the classroom has a distinct effect on their level of confidence. If one takes a thread through the lens of EST, one

can also acknowledge the point that learners' individual traits have an effect on their behaviour.

5.4 Social factors

5.4.1 In the school

a. Peer relationships

This study found peer relationships as a social factor that could influence Grade 7 learners' performance in a Mathematics classroom at primary schools. The interaction between learners has an impact on the way they learn. There are positive and negative connotations to the social interactions between peers in a classroom. Some learners thrive when they are working in groups and other learners do not. Peer learning has been found to be beneficial for the learners considering the academic and social relationships. According to Colcough, Al-Smarria, Rose and Tembon (2022), it is confirmed that peer relationships matter as girls in Africa have been sidelined more than boys. This is not actively pursued in this study, however, it may be an issue in some countries, especially in Africa (Colcough, Al-Smarria, Rose & Tembon, 2022). Sound peer relationships are necessary for the social well-being of learners (Camerini & Schulz, 2018).

b. Learner-teacher relationship

This study found teacher-learner relationships as a social factor that could influence the Grade 7 learners' performance in the Mathematics classroom at primary schools. Learners are more willing to learn and be prepared to learn in the class when the teacher gives them the opportunity to express themselves. Teacher interaction with learners contributes directly to learner engagement in the classroom (Yuan, Xiatao & Taisheng, 2018). The relationship that a teacher has with the learners is important in enhancing teacher-learner relationship with learners. Learners and well as their parents rely on the opinions of the teachers; thus teacher perceptions of learners are

important for the success of learners (Sneyers, Van Hoof & Mahieu, 2018). Teachers who are willing to integrate new issues into the curriculum have more chances of being success than teachers who are not prepared to do it (Foran, Manion & Rutheford, 2017). Teacher expectations influence how teachers behave in class and are a major contributor to learner achievement (Kotok, 2017; Woodcock & Hitches, 2017). A study in Ghana confirmed that a good relationship between learners and teachers provides a good framework for learner enhancement (Akeyeampong, 2017). When teachers have a new concept to teach, they express great enthusiasm. The confidence that teachers display when they are teaching and engaging with learners is important in the confidence that learners adopt and this means that learners will be prepared to work hard and prosper. The way that a teacher behaves has a direct impact on the learners they teach (Stelmach, Kovach & Steeves, 2017). The results of this study highlight the relationship between learners and their teachers as one that has an impact on the performance of learners. Teachers need support in acquiring required skills (Albright et al., 2017). A positive teacher attitude means that the atmosphere in the class is a positive one and conducive to teaching and learning.

5.4.2 Family issues

This study found family issues as a social factor that could influence the Grade 7 learners' performance in the Mathematics classroom at primary schools. The family unit is an important one in as far as the holistic well-being of learners is concerned. When a child is protected by the family structure, it becomes easier for him or her to navigate worldly problems. Learners who believe that they have the support of their parents do better academically as they are supported emotionally (Peteros et al., 2019). It is necessary to provide social and economic support to families to enhance learner engagement in school (Asongu, Orim & Nting, 2019). It provides some sort of security for them. Parents' working hours do not allow them to interact with their children giving them emotional support. These parents are also not in a position to

take care of the emotional needs of their children. Learners who have family support are reported to achieve higher academic scores than those who do not have the support of the family (Schulze & Lemmer, 2017). A social worker assigned to the school can take care of the learners' emotional needs, and that helps. Learners from poorer homes have more difficulty than their counterparts from higher backgrounds.

5.4.3 Community issues

This study found that community issues are a social factor that could influence the Grade 7 learners' performance in the Mathematics classroom at primary schools. The social ills a society experiences come into the school because the learners come from the same community. Learners are forced into gangs early on in their lives. Learners who reside in socially unfavourable conditions struggle at school because they are constantly fighting for survival (Urbina-Garcia 2019). The communities they come from are poor and the members of these locations have not seen a better life for their children. A study conducted in Brunei proposes that in order for a learner to be successful success, we need to focus on the communities that surround the schools (Abdullah, Shahrill, Yusof & Prahmana, 2018). According to an African study it has been established that interventions are necessary for the living standards to learners (Asongu, Orim & Nting, 2019). Considering the EST used in this study it is evident how learners' development is affected by their surroundings. Learners who come from different backgrounds and this difference culminates into fighting when it comes to sitting in a classroom together. The schools that have these kinds of issues are ones that provided food to the learners and they sometimes feel that the school is a safe haven for them.

5.5 Academic factors

5.5.1 Comprehension of concepts

This study found comprehension of concepts as an academic factor that could influence the Grade 7 learners' performance in the Mathematics classroom at primary schools. The comprehension of concepts is a problem for many learners. They may be able to learn the retention of mathematical facts, but the comprehension of concepts means that they cannot understand what is being told to them. It would be great for teachers to try different strategies to get learners to understand, concepts like fractions and geometry are more complicated to understand (Roesslien & Coddling, 2018). The conceptual foundation has not been laid down adequately and this is the reason that the learners struggle with mathematics in this phase. Learners show a distinct lack of understanding of the concepts.

5.5.2 Mathematics learning difficulties

This study has found Mathematics learning difficulties as an academic factor that influences the Grade 7 learners' performance in the Mathematics classroom. Mathematical learning difficulties are prevalent among learners because of immature mathematic strategies. Specific teaching aides have to be used for these difficulties. An African study supports the idea that an upgrade to technology will be beneficial for the enhancement of education in Africa (Samarakoon, Christiansen & Munro, 2017). Learning needs to be differentiated, in a sense that it goes to abstract learning gradually, and take advantage of what learners know then introduce what they do not know (Fitriani, Suryadi & Darhim, 2018). There is need for teachers to adapt and modify their strategies to match the learning needs of the learners.

5.5.3 Teaching Mathematics in the learners' second language

This study has found teaching mathematics in the learners' second language as an academic factor that could influence the Grade 7 learners' performance in the mathematics classroom at primary schools. Furthermore it is proposed by this study that learners struggle because they are being taught in a second language. According to Choi, Jeon and Lippard (2018), it has been proposed that learners receive intervention in the second language early to enhance mathematical ability later in their schooling careers. Most of the learners in this study are second language English speakers and the study found that teachers felt they are not knowledgeable enough to teach learners in their vernacular language.

RESEARCH QUESTION 2: What are the experiences of Grade 7 learners in Mathematics in relation to the downward trend discernible in their results when they reach the Senior Phase?

5.6 Enthusiasm that learners experience in the Mathematics classroom

This study found enthusiasm that learners experience in the mathematics classroom as an experience that influences the Grade 7 learners' performance in the mathematics classroom at primary schools. The excitement and enthusiasm that learners feel when they excel in Mathematics make them feel elated. Learners expressed joy at being able to understand a mathematical problem, as well as being able to use Mathematics in their future careers. The feeling they get from mathematics is that they can better themselves when they have done well in Mathematics. When teachers use mathematical modelling, giving the learners the opportunity to interact with the learning material, this creates enthusiasm in learners (Riyanto, 2019). When they understand Mathematics, they become aware of complex issues related to the world. Knowing mathematics gives learners the confidence to navigate complex issues. Many learners in the study love Mathematics because they love their teacher.

The teachers regulate the atmosphere in the class; this comes from the teacher's classroom management style (Lazarides, Buchholz & Rubach, 2018).

5.6.1 Comprehension of concepts

This study has found comprehension that learners experience in the Mathematics classroom as an experience that influences the Grade 7 learners' performance in the Mathematics classroom at primary schools. Learners have expressed pleasure in getting to understand difficult topics in Mathematics. They showed joy for understanding something that is new. They feel engaged when they are occupied with mathematical activities that they can do well. Performance in Mathematics depends largely on the comprehension of concepts (Peteros et al., 2019). Learners who understand what they are doing in a subject, will perform better and be more enthusiastic in the mathematics classroom.

5.6.2 Motivation that learners feel in the Mathematics classroom

This study has found motivation that learners experience in the mathematics classroom as an experience that influences the Grade 7 learners' performance in the mathematics classroom at primary schools. When learners understand and receive positive feedback, they will be motivated to do better. The success they achieve gives them the initiative they need to succeed. They are acknowledged that they will be successful, when they pass. When they have achieved self-efficacy, this will be a motivation for them. According to Anigbo and Ekene (2018), the factors that encourage motivation are several, that have been explored in this study, factors such as parental involvement, teacher attributes, learner attributes among others. This study has also emphasized the importance of motivation for learner success. A study has found that learner motivation is dependent on learners' performance more than being goal-orientated (Mouratidis, Michou, Demircioglu & Sayil, 2018).

5.6.3 Peer-Assisted learning - a positive experience for learners

This study has found peer-assisted learning that learners experience in the mathematics classroom as an experience that influences the Grade 7 learners' performance in the mathematics classroom at primary schools. This is a positive experience for learners, as they have the opportunity to learn themselves, while they are teaching and learning from each other learners feel positive, that when they are with their friends they will attain success. The behaviour of learners improve when they have their friends to work with. They can work together on issues they are struggling with and this enhances the learning environment. Learners who are minority groups and struggling learners especially should be grouped so they can help each other and foster learning relationships (Thorius & Graff, 2018).

5.6.4. Positive learner-teacher relationships

This study has found learner-teacher relationships that enhance the learning environment as an experience in the mathematics classroom as a factor that influences the Grade 7 learners' performance in the mathematics classroom at primary schools. Learners have faith in their teachers. When they have the support from the teachers they are usually successful. An African study that supports the integration of technology into education laments the issue of teacher training and this is a major issue that hampers learning (Samarakoon, Christiansen & Munro, 2017). They appreciate it when their peers respect the teachers and feel comfortable in a class, and when they have a good relationship with their teacher. The familiarity that learners have with their teachers is a positive attribute that they experience. teachers should allow learner more power in choosing their method of learning and working with the curriculum (Robertson, 2017).

5.6.5 Positive socio-economic environment at home that is conducive to learning for learners

This study has found that a positive socio-economic environment as a factor that influences the experience of Grade 7 learners' performance in the Mathematics classroom at primary schools. The environment at home is important for the optimal performance of learners; this is evident in a study on African adolescents (Somefun & Odimegwu, 2018). The learners who have a positive social home environment at home were more successful in school. they have a solid support system at home, they will thrive, the home environment supports the emotional well-being and also gives them safe space to work. Studies have shown a positive relationship between SES and learner achievement (Berkowitz, Moore, Astor & Benbenishty, 2018; Chesters & Daly, 2017).

RESEARCH QUESTION 3: What are the challenges that Grade 7 learners encounter in Mathematics?

5.7 Anxiety experienced by Grade 7 learners in the mathematics classroom

This study has found the anxiety experienced by Grade 7 learners in the Mathematics classroom as a challenge for learners. The learners have confessed to feeling anxious at the thought of going to a Mathematics class. when learners are faced with something new and unknown, they feel stressed at the prospect of the interaction with the topic. Learners feel that numbers give them some amount of anxiety. Reviewed literature has defined anxiety as a mental health issue associated with learning (Luttenberger, Wimmer & Paechter, 2018).

5.7.1 Peer disruptions in the Mathematics classroom

This study has found peer disruption experienced by Grade 7 learners in the Mathematics classroom as a challenge for learners. The learners in this study have

obstacles such as disruptions caused by their peers; they sometimes are not on the same level of discipline. Classroom control strategies are an element that is important for the elimination of peer disruption in the classroom; it takes planning of limits based on the needs of all the learners in a class and is a necessary skill set for teachers to adopt (Gonzalez-Ponce, 2020). It is important for learners to have some social and emotional support from professionals, as this is a leading factor that impedes learners' development (Kiweewa, Knettel & Luke, 2018). Learners feel that there are learners who are not well-mannered and shows disrespect to the teacher and does not adhere to the rules, these learners cause problems in the class in the form of misbehaviour. There is noise and this does not allow for efficient learning.

5.7.2 Time management

This study has found peer disruption as a challenge for Grade 7 learners in the mathematics classroom. Time is important in the Mathematics classroom, as it takes time to understand complex topics. Learners need time to spend with their teachers, as well as time to consolidate work that has been taught already. Learners do not have the necessary ability to be able to manage their time accurately to avoid late assignments. In recent years, there was an increase in risk-behaviours among young children in Sub-Saharan region, countries like Zambia and South Africa specifically, and this impedes learners' academic performance (Ssewanyana & Bitanihirwe, 2018). When the class is not managed adequately, then there are always challenges for the learners. Time management is a problem in rural schools in South Africa, as this hampers learner performance (Waller & Maxwell, 2017).

5.7.3 Misunderstanding of complex topics

This study has found peer disruption as a challenge for Grade 7 learners in the Mathematics classroom, therefore, topics such as fractions and patterns are difficult and complicated for the average Mathematics learner. They have this preconceived

idea that it is difficult and this may be why it becomes a challenge for them. Learners often misunderstand problems, they are unable to understand issues, and choose the wrong procedures for solving a problem (Novitasari, 2018). In a Tanzanian study, it emerged that learners from Grade 4 to 6 experience high levels of poverty and violence and this affects their ability to work academically (Berger, Benatov, Cuadros, VanNattan & Gelkopf, 2018). The learners in this study felt that if they were allowed Mathematics manipulative like calculators earlier, it would make their learning easier and they would have time to work.

5.7.4 Negative learner-teacher relationships

This study has found negative learner-teacher relationships as a challenge for Grade 7 learners in the Mathematics classroom. Learners who have negative relationships with their teacher have negative experiences in the classroom. They are not sure of the work, and there is some tension prevalent in this situation. The classroom is often not conducive to learning and teaching because the teacher does not have control of the class. This is supported by Bergen, Graham and Sweller(2020), regarding negative relationships between learner and teacher, that learners who have had negative relationships with their teachers earlier on their schooling careers are usually more disruptive in their behaviour. It is important for teachers and learners to be in a supportive environment, to accentuate learners' performance in the class (Stoppelbergin, McRae & Smith, 2020). One problem in Kenyan schools is the overcrowding of classes, which does not allow teachers to form relationships with learners thereby affecting their performance (Hungu, Njagi, Wekulo & Ngware 2018). The learners in this study have expressed their unhappiness, that when the teacher is upset, she will take her frustrations out on the teacher. This study has found that learners would appreciate a more friendly relationship with their teachers. Bronfenbrenner's EST states that the nature of the relationships that individuals have with their relevant parties in their environments plays a major role in their development.

5.7.5 Shortage of learning resources

This study has found the shortage of learning resources as a challenge for Grade 7 learners in the Mathematics classroom. According to the teachers in this study, the problem is not that they do not have the resources, they have expressed their issues with learners who do not look after the resources, and two schools have stated that they cannot provide textbooks to learners, as learners do not look after the books. The use of more modern technological resources is important for learner satisfaction in the class. The learners in this study were equally varied in using and not being able to use a calculator. The researcher feels that if learners have access to teaching materials like electronic calculators, they can focus on conceptual understanding of issues, and that is the core of Mathematics (Abadi, Pujiastuti & Assaat, 2018).

5.7.6 Negative socio-economic environment

This study has found the shortage of external distractions is a challenge facing Grade 7 learners in the Mathematics classroom. Learners in this study have situations at home that negatively affect their schooling and learning, in the form of overcrowded homes. Some parents tend to place much responsibility on learners. The EST which guided this study also proposed the microsystem, the home of the learners this is one of the environments that a learner spends a lot of time and this has a specific effect on the individual. A study conducted in Kenya supports the notion that the overcrowding as well as the poverty in their schools affect the performance of learners (Hungu, Njagi, Wekulo & Ngware, 2018). This holds true for learners cannot function optimally when they are overworked, it is important for families to realise that learners need a safe environment to thrive in academically (Chinyoka & Naidu, 2012). The learners in this study were stressed from the emotional responsibility they have to carry.

RESEARCH QUESTION 4: What strategies can be devised by Mathematics teachers to overcome academic challenges experienced by learners at the Senior Phase?

5.8 Using of extra classes

This study has found the use of extra math classes as a strategy that could be used for overcoming the academic challenges experienced by Grade 7 learners in the Mathematics classroom. Extra Mathematics classes means that learners join a Mathematics class as an intervention session for something they did not understand. All schools usually have these classes for learners who are struggling, and this is a novel way of eliminating the difficulty learners experience. Learners who want to be successful should ensure that they are regular attendees at their classes (Addo 2018). The problem with it, is that it is not always accessible for all learners. In a study conducted in Nairobi, it was confirmed that the time for intervention should be determined as soon as possible. Early intervention will remedy the situation sooner, than later (Hungu, Njagi, Wekulo & Ngware, 2018). The time it happens is after school, learners are usually tired by this time and they want to be on the sports field. Teachers in Brunei felt that instead of giving extra lessons, teachers should modify their teaching skills and move away from “chalk and talk”, which is the major way of preparing learners for assessment in Mathematics (Shahrill, 2018:5).

5.8.1 Employing the services of a Maths coach

This study has found that employing the services of a math coach was a strategy that could be used for overcoming the academic challenges experienced by Grade 7 learners in the Mathematics classroom. Maths coaches are individuals who join the Mathematics classes as a teacher’s aide, they assist learners in understanding complicated topics. A study done in Ghana recorded some success with education students who play the role of Maths coaches and this has added value to the

performance of the learners (Wolf, 2018). They liaise with teachers to make sure they are teaching what the learners are struggling with. A study promoted the employment of Maths coaches in that there is a considerable outcome in the employment of these Maths coaches and the performance of learners (Harbour & Saclarides, 2020). The Maths coaches help keep the class under control and assist in promoting a learning environment.

5.8.2 Upgrade to electronic technology in the Mathematics classroom

This study has found the using of electronic technology was a strategy that could be used for overcoming the academic challenges experienced by Grade 7 learners in the Mathematics classroom. Learners in 2021 are exposed to technology daily and are still forced to work from a chalk board. There were six schools who participated in this study and only one had access to a smart-board, this negatively impacts learning as all the learner participants as well as teachers felt there was a need to upgrade the technology in the schools. It is not enough to send them home with websites to search, but we have to upgrade our current resources to include modern electronic technology. This is supported in an article by Malik (2018), wherein he states that the whole world is changing, and schools today are still teaching skills that are highly outdated. There is a desperate need for the overhaul of the education system globally. Africa needs to transform its education system through the integration of information and communication technology (ICT). Although this may be a massive step, it is a necessary step for the advancement of education in Africa (Barakabitze et al., 2019). Added to this it has been noted that there is a “digital divide” between people in this century, those who can afford access to digital technology and those who cannot (Schradi, 2018). South Africans may not be able to afford to close this digital divide.

5.8.3 Using learner-centred teaching approaches

This study has found the use of learner-centred teaching approach as a strategy that could be used for overcoming the academic challenges experienced by Grade 7 learners in the Mathematics classroom. Mathematics is a very intricate subject, and the requirement is that it should be taught in a practical way. Not only through digital technology, where learners visualise an image, but also using manipulatives as boxes and blocks. This is lacking in the foundation phase as teachers do not have the time to use manipulatives, and learners have not been exposed to these types of manipulatives. A study conducted in Nigeria proposed that for the advancement of learners in that country it is necessary for educators to be trained in learner-centred teaching skills (Ajani, 2018). Similarly, for learning to be successful, it is necessary for learners to have the learning opportunities considering the media needed, considering that it is necessary for the teacher to give the learner a physical objects in order to know what to do with it (Meke & Wutsqa, 2018). Teachers must consider the needs of the learners when they are deciding on teaching strategies to implement.

5.9 Recommendations to the study

The recommendations made in this chapter are based on the findings of the study. This study has explored the factors influencing Grade 7 learners' performance in Mathematics; the recommendations are being made for the psychological, social and academic factors that influence Grade 7 learners in the Mathematics classroom. Furthermore, the study will make recommendations for the experiences that Grade 7 learners experience in the Mathematics classroom. The section has made recommendations for the challenges that learners have experienced in the classroom. Lastly, recommendations will be made with regard to the strategies that teachers have suggested could enhance the performance of Grade 7 learners in the Mathematics classroom.

5.9.1 Factors influencing learners' performance

5.9.1.1 Psychological factors

This study has explored the factors influencing Grade 7 learners' performance in Mathematics in the Frances Baard District. Regarding the psychological aspect, it is recommended that teachers approach learners from a collaborative perspective; they need to fulfil the needs of their learners from an emotional and psychological perspective. Learning strategies need to be integrated and grouping learners with each other may be a good idea. Learners have displayed resilience in the face of the difficulties they have faced, and this shows that grit does exist for these learners. They should be encouraged as they show enthusiasm and this is once again dependent on the teacher's approach. The disengagement of learners stems from not being fully integrated into the classroom. This study suggests more project-based learning, and a cry for the classroom to change from the lecture room that it is to a room that allows learners movement and problem-based learning. Instead of teaching a concept, give learners a problem and ask them to solve it, thus giving learners the opportunity to acquire critical thinking skills.

Learner anxiety is caused by time management deficiencies, it could be an option for teachers to start an intervention programme in which they teach learners to manage their time. Teachers should assume that learners know how to do this; however, it has become evident from this study that learners are not able to manage their time. Practical examples would help them to learn how to break their time into chunks and fill it with relevant tasks.

Learner behaviour did not seem to be a factor that influences the behaviour of learners in the Grade 7 Mathematics classroom. All the teachers that were interviewed did not feel they had a disciplinary problem in their class. Learner confidence is boosted by success; thus, it is necessary for the teachers to give the learners opportunities in

which they can succeed and encourage a “can do” mindset among the learners. It is also necessary to differentiate teaching strategies, and assessment tasks for learners eliminate the anxiety associated with Mathematics learning.

5.9.2 Social issues

Although there are prevalent school issues, peer interactions are supportive and those few places where it may be problematic would need a social worker, as one school has an onsite social worker, who is tremendous in the work she does. This study recommends that every school has some social support and not only very rural schools as there are learners in the higher SES too, who need social support. As far as learner-teacher relationships are concerned, this study recommends that cooperative learning be the norm and learners need to be part of the learning choices they make; thus, school authorities may choose the curriculum however it is necessary for learners to have a choice in the delivery and outcomes of the material. This will enhance the relationships that teachers have with learners and thereby enhance performance.

5.9.3 Academic factors

5.9.3.1 Comprehension of concepts

As far as the academic factors are concerned, it is necessary for the Department of Basic Education to consider training for educators in more advanced technology needed in the classroom. It is not just merely training teachers to use the smartboard, which is just a smart chalkboard, but rather from a holistic point of view like teaching robotics, which will change the face of learning. Learners are at an age where they do not have a problem understanding the concepts; rather, they have an issue with the delivery of the concepts and for this classroom has to accommodate the learners different learning styles. Mathematical learning difficulties would require differentiated

learning and assessments to be implemented. This study suggests that learners who are taught Mathematics in their second language should be taught the basics in their home language and the gradual integration of English should be implemented. They should receive adequate intervention in English, for them to understand the mathematical concepts.

5.9.3.2 The experience that learners encounter in the Mathematics classroom

Learners experienced excitement at understanding a concept and this is encouraged as it enhances the performance of learners in this class. Learners feel motivated by this prospect and teachers are encouraged to continue in this vein and teach learners so they understand and are encouraged by their success. It is recommended that teachers adopt a kind attitude to encourage learners to work hard and perform optimally. Learners who have a positive SES will have a support system that allows them to spend their time learning instead of trying to survive. They do not need much as they get food and all learning materials from the schools they attend; they need a positive home environment that is conducive to learning.

5.9.4 Challenges encountered by learners in the Grade 7 Mathematics classroom

5.9.4.1 Anxiety as a challenge for learners in the classroom

The anxiety that learners experience in the Mathematics classroom is twofold, which is intrinsic and for this learner need special attention from their teachers, and support from families and stakeholders in the education spheres. The extrinsic factors include the feelings of anxiety in the classroom, because of panic in the classroom. This study recommends that teachers be the facilitators in the classroom; they will determine the atmosphere that is created and maintained in the classroom, and therefore teacher training is vital in this regard. Teachers need to do a self-evaluation and see where they need to improve and where they can share best practices. In the light of this

recommendation, the recommendation for professional learning communities (PLCs). This will also help new teachers who can learn from the expertise of more experienced teachers. PLCs should be put in place across the province and also across schools in the district.

5.9.4.2 Peer disruptions

Peer disruptions occur because learners are not fully engaged and to eliminate the problem of engagement in the class, the recommendation has been made above, with regard to learner disengagement. It is recommended that cooperative learning groups should be facilitated by the teacher and learners need to teach each other. In the average South African classroom, class sizes are too big for one teacher and a good option would be cooperative learning groups. On the one hand, this gives the strong learner the opportunity to develop as a leader and also to internalise the learning process. On the other hand, it makes the weaker learner understand, because he/she is learning from someone on his/her own level.

5.9.4.3 Time management

Based on the findings, it is recommended that time management skills should be taught to learners in the classroom, thus a recommendation was made for further study in the other subjects taught in the classroom. The idea behind this strategy is to find out what the teachers are experiencing in the classroom.

5.9.4.4 Negative teacher relationships

In all aspects, the teacher is the adult and will be the responsible party. Teachers need to be trained in this regard, as they are not only teachers but also act in loco parentis, which means acting in the position of the parent at school. This gives them the place of nurturer for the learner. If teachers embrace their social position in the classroom,

this will give them the opportunity to interact with learners on a holistic level, thereby enhancing the learning environment.

5.9.4.5 Shortage of learning resources

The learners in this study wanted to have access to a textbook, but all the teachers in this study said that they had ample resources. The finding of this study is that learners want access to books, yet they do not look after the books, and schools have a responsibility to keep the books in a good condition. It is recommended that copies should be made, as the poorest schools in rural areas must at least have a copy machine. However, it is the recommendation of the study that learners should upgrade from the use of a textbook to more modern technology and use a tablet for books. This recommendation is for the Department of Basic Education, given that the upgrade is a costly one.

5.9.4.6 Negative socio-economic status

The negative SES described here is the perspective of the learners. The current study found that learners must deal with adult issues of having to look after siblings and homes as parents are often working far away from home and older siblings must care for younger children in the home. It is recommended that social service providers must intervene and help parents who are struggling to afford day care for their children to remove the burden from learners.

5.10 Reflection on the study

This study has explored the factors that influence Grade 7 learners' performance in Mathematics. Mathematics is the kind of subject that learners need to work to their full potential. It is envisaged that success in the subject enables learners to function in their chosen careers, culminating in that success for learners today, and broader society. However, learners struggle when they reach Grade 7 and this becomes a

problem, as they are then unable to do Mathematics. This study fills the gap in exploring solutions to the resolve this problem.

The current study explored the social factors that affect learners and the challenges that affect their performance. The study reflects on the various situations that affect learners' performance and will give the relevant social and education departments a lever to work from so they can make the necessary changes and fulfil the needs of parents and children that attend public schools. The study further explored the academic factors that influence Grade 7 learners' performance. The learners need classrooms that are upgraded to a more technological friendly environment. They also need collaborative learning accommodations that must be made for the future learner.

5.11 Conclusion

In this chapter, the researcher discussed the findings of the study based on the research questions. The first research question addresses the factors that influence Grade 7 learners' performance in Mathematics. The psychological factors that were discussed are learner resilience, learner enthusiasm, disengaged learners, learner anxiety, behaviour of learners, and learner confidence. The social factors are, peer relationships, learner-teacher relationships, family issues, and community issues. The academic factors that influence learner performance are the comprehension of concepts, mathematical learning difficulties, and teaching Mathematics in the learners' second language.

The second research question addresses the experiences of Grade 7 learners' performance in Mathematics in the classroom setting. These experiences are enthusiasm experienced by learners, the comprehension of concepts, motivation of learners, peer-assisted learning, positive learner-teacher relationships, and the positive socio-economic environment at home that is conducive to learning. The third research question focused on the challenges that learners experience in the Grade 7

Mathematics classroom. These include, the anxiety experienced by Grade 7 learners, peer disruptions, time management, misunderstanding of topics, negative learner-teacher relationships, the shortage of learning resources, and a negative socio-economic environment. The fourth research question reflects on the strategies that teachers can use to overcome the academic challenges that Grade 7 learners experience in Mathematics. These strategies include the use of extra classes, employing a Maths coach, the upgrading to electronic technology in the Mathematics classroom, and using mathematical manipulatives to teach complicated topics. Furthermore, the researcher discusses the recommendations made for every discussion mentioned above.

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APPENDICES

APPENDIX 1: BIOGRAPHICAL INFORMATION OF EDUCATORS TEMPLATE

1. Name and Surname: _____
2. School: _____
3. Age: _____
4. Year experience teaching Mathematics _____
5. Race: _____
6. Gender: _____
7. Highest qualification: _____
8. Home language: _____
9. Residential area: _____
10. Other subjects taught: _____
11. Do you wish to share your personal growth plan: _____

APPENDIX 2: INTERVIEW GUIDE- TEACHERS

1. What are the factors that influence Grade 7 learners' performance in Mathematics in the Senior Phase?

- 1.1. How do you feel about teaching Mathematics?
- 1.2. Have you attended or currently attending any development classes for mathematics teaching, eg. Advanced certificate in teaching - Mathematics
- 1.3. What level of ICT is used in your class?
- 1.4. What form of discipline is used in your classroom?
- 1.5. What level of parental involvement do you have in your maths class?
- 1.6. What do you need to improve the mathematics performance in your school :
 - From parents
 - From learners
 - From your school
- 1.7. Do you think that there are some learners who are just not able to learn Math? Or is everyone capable of learning Maths?
- 1.8. Do you think the attitude of learners in the Math class has an effect on their performance
- 1.9. How are learners affected by their social backgrounds?
- 1.10. How are learners affected by their own emotional situations?
- 1.11. How strong is their academic ability considering their levels of resilience portrayed in the class?

2. What strategies can be devised by Mathematics teachers to overcome academic challenges experienced by learners at the Senior Phase?

- 2.1. How do you think learners feel about your teaching strategies?
- 2.2. Do you use positive reinforcement strategies in your class, e.g. rewards system
- 2.3. What do you need from your school to improve your learner's Mathematics performance?

- 2.4. What intervention strategies are being used at your school?
- 2.5. What challenges are experienced with regard to this intervention:
- 2.6. Are there learners who attend external intervention classes, do you advocate it, or is it a problem?
- 2.7. Do you have enough LTSM in your school? (textbooks)
 - Are learners allowed to take these resources home?
 - What are the alternatives
- 2.8. Are learners taught in their home language? Does this affect their understanding of mathematical concepts?
- 2.9. What is the most difficult issue for learners to do:
 - Understanding of concepts
 - Retention of facts
- 2.10. Do you use textbooks examples, or your own explanation methods – how familiar are you with the culture of the learners to be able to bring the lessons into context of their lives
- 2.11. Which concept do learners understand easier? Which are the most difficult? Why the difference?
- 2.12. Those concepts like 3D shapes that are more concrete to teach, is it possible that they are more difficult because of the developmental stage the learners are in?
- 2.13. Do you think that the knowledge learners come into grade 7 with is adequate to equip them to understand Grade 7 Mathematics?
- 2.14. How do learners' resilience affect their performance in the class?
 - Social resilience
 - Emotional resilience
 - Academic resilience

APPENDIX 3: FOCUS GROUP DISCUSSION – LEADING QUESTIONS

- 3. What are the challenges that Grade 7 learners encounter in Mathematics?**
- 3.1. What is the major obstacle you perceive in the Mathematics classroom?
 - 3.2. What do you need in the form of intervention that will help you with your Mathematics performance?
 - 3.3. Do you have all the necessities of a maths class – textbooks, or stationery
 - 3.4. Do you need Mathematics to pursue the career of your choice?
 - 3.5. Where do you do your homework at home?
 - In your room
 - In a study
 - With siblings at a dining room table
 - 3.6. What is the most difficult for you:
 - Understanding of concepts
 - Retention of math facts like tables
 - 3.7. Does your teacher understand your difficulty and why you struggle in certain concepts?
 - 3.8. What is your relationship with your teacher?
 - 3.9. Does he/she understand the concept well?
- 4. What are the experiences of Grade 7 learners in Mathematics in relation to the downward trend discernible in their results when they reach the Senior Phase?**
- 4.1. What has been your experience in Mathematics till now – over the years?
 - 4.2. What has changed for you in Mathematics this year?
 - 4.3. Have you been attending intervention classes?
 - Yes – how has it benefitted you
 - No – why
 - 4.4. How does the behaviour of your peers in the class affect your classroom situation?
 - 4.5. Do you have situations at home that affect your learning at home?
 - 4.6. What subjects do you want to choose when you go to Grade 9?
 - Does this include pure maths or is your choice maths literary if so why?
 - 4.7. What do you need to improve your mathematics performance?

From:

- Parents
- Teachers

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received approval from the Research Ethics Committee of UFS. A copy of the approval letter can be obtained from the researcher.

Approval number: *Still to receive this*

WHAT WILL HAPPEN TO YOUR CHILD IN THIS STUDY?

Your child will be invited to join a few other learners in a conversation about their experiences in Mathematics.

CAN ANYTHING BAD HAPPEN TO YOUR CHILD?

The researcher does not foresee anything bad happen to your child.

CAN ANYTHING GOOD HAPPEN TO YOUR CHILD?

Yes, your child will feel that he can contribute to the betterment of his schooling or for children still to come.

WILL ANYONE KNOW YOUR CHILD IS PART OF THE STUDY?

No one has to know except the school and that is upto you. It is not a secret survey and will not negatively affect the reputation of anyone or any institution.

WHO CAN YOU TALK TO ABOUT THE STUDY?

You may talk to anyone that you wish.

WHAT IF YOU DO NOT WANT YOUR CHILD TO DO THIS?

If at anytime that the child would like to leave the discussion he may do so, with no difficulty.

PLEASE RETURN

Name of child: _____

Name of Parent: _____

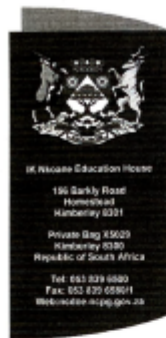
- Do you understand this research study and are you willing to let your child take part in it? Yes No
- Has the researcher answered all your questions? Yes No
- Do you understand that you can withdraw from the study at any time? Yes No
- I give the researcher permission to make use of the data gathered from my child's participation Yes No

Signature of Parent

Date



APPENDIX 5: NDOE APPROVAL LETTER



DEPARTMENT OF EDUCATION

Enquiries: J.N. Home
 Contact No.: (053) 839 6536
 Reference: L2.10.2.4.3
 Date: 23 March 2021

Ms F Ajidumin
 5 Tsessebie Street
 Verwoerd Park
 Kimberley
 8300

Dear Ms Ajidumin

APPROVAL TO CONDUCT RESEARCH

The aforesaid matter with our Ref. L2.10.2.4.3 bears reference.

This letter serves to indicate that conditional approval is granted to conduct research for the dissertation titled: "Exploring factors influencing Grade 7 learners' performance in Mathematics in Frances Baard District."

The onus rests with you as the researcher to organise appropriate and relevant time schedules with the school/s and educator/s involved in order to conduct the research. Copies of these approval letter must be presented to the school/s (Principal and SGB) and to the District Director as proof that permission for the research has been granted.

The following conditions must be strictly applied to conduct your research in the Northern Cape Department of Education. Approval may be withdrawn should any of the conditions listed below be flouted.

Criteria for approval	Comment
Value of the proposed research	The Research Topic covers a policy position of the Basic Education Sector and thus has value.
Policy and Strategic Alignment	The Research is aligned to Policy and to the Medium Term Strategic Framework as teacher development falls within the ambit of the Six Priorities of the Basic Education Sector, as well as Outcome Two of Priority Three of the MTSF.



Potential benefits to the NCDcE	The NCDcE would benefit from the research as empirical evidence would be available that is derived from the Northern Cape experiences.
Contribution to the knowledge base and literature in the Basic Education Sector	The Research Report findings will contribute to the knowledge base and literature of the Basic Education Sector after undergoing the necessary scrutiny by Rigour and Ethical Issues.
Appropriateness of the methodology adopted	The methodology identified is appropriate for the study as the views of teachers and learners will be examined through interviews and focus group interviews which is suitable for a qualitative research study.
Ethical Considerations	Ethical clearance by the Research Ethics Committee of the University of Free State is pending subject to the permission granted by the NCDcE.
Accountability	The accountability is as per NCDcE Research Guidelines.
Conditions to be agreed by the applicant	The conditions to be adhered to are as per NCDcE Research Guidelines.
Types of Research	Qualitative Research has been identified by the researcher.
Datasets	No datasets was requested by the researcher.
Covid -19 Considerations	The research will be conducted via semi-structured interviews and questionnaires and COVID-19 health protocols viz wearing a mask, regular sanitizing and social distancing will be adhered to.

Please note that the research at institutions within the Northern Cape Education Department can only commence after submission of the Ethical Clearance Certificate/letter issued by the Ethics Committee of the University of Free State.

The Northern Cape Education Department wishes you well in this important undertaking and is looking forward to assisting the findings of your research study.

Kind regards


 MR. P.S. BEUZANA
 ACTING HEAD OF DEPARTMENT

24/07/2021
 DATE

APPENDIX 6: PERMISSION LETTER: PRINCIPAL

Date: _____

Principal of..... Primary School

RE: Permission to conduct a research study

Dear Sir

I am herewith requesting permission to conduct a research study at your school,.....Primary School.

I am currently enrolled in the Faculty of Education at University of Free State, I am in the process of writing my Masters' Dissertation.

The study is entitled:

Psychosocial factors influencing learners' performance in Mathematics at a primary school in the Frances Baard District.

I hope that the school administration will allow me to recruit one Grade 7 Educator to partake in an anonymous interview. I will also need to recruit one Grade 7 boy and two Grade 7 girls to anonymously be part of a focus group discussion. Consent forms will be given to the school to be sent home and completed by the parents. All this will happen after school hours at an easy to access venue in Kimberley.

The interview of the educators will be at their convenience and not in school hours.

I am available if you need any clarification in this matter.

The survey results will be pooled for the dissertation project and remains the property of The University of Free State.

If you agree, kindly sign below and return the signed form in the enclosed self-addressed envelope. Alternatively, kindly submit assigned letter of permission on your Institution's letterhead acknowledging your consent and permission for me to conduct this survey at your school.

Sincerely,
Fatima Ajimudin
083 559 7111
Student Number: 2016341345

Approved: _____

Print your name and title here _____

Signature Date: _____

APPENDIX 7: ETHICAL CLEARANCE CERTIFICATE



GENERAL HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

19-May-2021

Dear Mrs Fatima Ajimudin

Application Approved

Research Project Title:

**Exploring factors influencing Grade 7 learners' performance in Mathematics in the Frances
Baard District.**

Ethical Clearance number:

UFS-HSD2021/0315/21

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis

Chairperson: General/Human Research Ethics Committee

Adri du Plessis Digitally signed
by Adri du Plessis
Date: 2021.05.19
17:39:34 +02'00'

265 Nelson Mandela
Drive
Park West
Bloubaan 9001
South Africa

P.O. Box 339
Bloubaan 9000
Tel: +27 (0)51 401
9337
adri@uwc.ac.za
www.uwc.ac.za



APPENDIX 8: LETTER OF EDITING



Mufasa Research Consultancy

SERVING WITH DISTINCTION

29 November 2021

To Whom It May Concern,

Re: Editor's Letter

Exploring factors influencing Grade 7 learners' performance in Mathematics in the Frances Baard District

Below is the scope considered during editing of the above titled MS:

- Grammar check
- Sentence construction
- Spelling check
- Punctuation
- In-text referencing
- Reference checking
- Formatting/document layout

As a professional editor, I pledge that the above aspects of the MS were, to the best of my knowledge, meticulously and correctly done at the time the work was sent to the student. However, I am not responsible for any corrections that were made after the editing process.

Yours faithfully,

Kemist Shumba (PhD)

Cell: +27 78 315 6186 Email: info@mufasarc.co.za Web: www.mufasarc.co.za
Address: 7 Chartham House, 180 Brand Road, Glenwood 4001, Durban, South Africa