PRIMARY SCHOOL LEARNERS' ATTITUDES ON MATHEMATICS LEARNING IN MATHEMATICS

By

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DECLARATION

I declare that **PRIMARY SCHOOL LEARNERS' ATTITUDES ON MATHEMATICS LEARNING IN MATHEMATICS: A CASE OF TWO SCHOOLS IN GROOT LETABA CIRCUIT, LIMPOPO PROVINCE** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

....

SIGNATURE **DATE**

(SB Rikhotso)

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ABSTRACT

This dissertation presents a study on the primary school learners, attitudes on Mathematics learning in the Groot Letaba Circuit of Mopani District in Limpopo Province. Performance in Mathematics by students has persistently been poor. This study sought to investigate the primary school learners' attitudes on Mathematics learning. The poor performance of learners in many schools in the Groot Letaba Circuit motivated the researcher to conduct this study. The situation is worsened by the inability of the heads of department and principals to guide and support educators. An exploratory qualitative case study research design was adopted for the study. The target population was 33 respondents, which comprised of five teachers and 28 learners from grade one to seven selected schools in Groot Letaba Circuit. The data for the research was collected by means of semi-structured interviews.

The study revealed that many learners have negative attitudes towards learning Mathematics and that there are many factors which contribute to the negative attitude. Improving on these factors and sensitization of the local community to discard practices which prohibit student's effective participation in learning Mathematics could improve performance in Mathematics. It is anticipated that the findings of this study will give curriculum developers new insights into emerging issues on performance and influence the Ministry of Education on policy formulation. Learners are also expected to benefit from the findings; because improved Mathematics performance will give them opportunities to pursue science related courses in higher institutions of learning and middle level colleges. The situation is worsened by the inability of the heads of department and principals to guide and support educators.

Finally, the researcher gave general recommendations for improving the attitudes of learners towards learning Mathematics.

Key Terms: Attitudes, Mathematics, Performance, Poor, Negative

DEDICATION

I dedicate this study to my mother Mphephu, who is my inspiration and to the Almighty God, my source of power.

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CHAPTER ONE

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Mathematics is one of the core subjects in primary school curriculum and performance in the subject is crucial for students' admission to scientific and technological professions. However, there are still many learners in the primary school who struggle in learning Mathematics. There has been persistent poor performance in this subject in primary schools, particularly in Groot Letaba Circuit as revealed by the following examination results:

	2010	**2011**	**2012**
Grade 5	37.4	35.4	40.3
Grade 6	39.5	39.3	41.4
Grade7	38.3	39.4	42.3

Table1. Mathematics results in Groot Letaba Circuit

Underachievement in Mathematics is particularly recognized as a major problem in schools serving disadvantaged communities (Mkhabela, 2004:23). Research has shown that the learners' achievement in Mathematics may be influenced by attitude towards the subject. According to Ma and Kishor (2003:18) the variable 'attitude' is one of the most important factors that relates to achievement in Mathematics. Stuart (2010:145) argues that teacher; peer and family attitudes towards Mathematics may positively or negatively influence learners 'confidence in Mathematics. It is therefore essential to analyse the influence of the learners' attitudes and beliefs on learning Mathematics in the primary schools.

1.2 BACKGROUND TO THE STUDY

The focus of this investigation is learners' attitudes towards learning Mathematics. Mathematics is an important subject for higher education, skilled jobs and national economy because it is a pre-requisite for studying many scientifically oriented professions (Justina, 2003:36). There is a strong emphasis on the provision of good quality Mathematics education in modern societies all over the world, (Igbokwe, 2010:68). Achievement in these subjects is recognized as one of the most reliable indicators for measuring social, economic, geographical and political development of nations (Justina, 2003:36). Mathematics is also very important for studying other subjects, such as, Physical Science and Technology Education. Mathematics is described as the bedrock of Science while Physical Science is the necessity for technological and industrial development (Betiku, 2009:49). Mathematics is also important in our daily lives, for example, Mathematics enhances creative and logical reasoning about problems in our inherently geometric world (Clements & Battista, 2002:10). Adequate skills and knowledge of Mathematics are vital components of successful contemporary life and socio-economic development (Department of Education, 2003).

Despite the international significance of Mathematics, the teaching and learning of Mathematics in South Africa is in a very poor state. Many learners are failing it and have developed a very negative attitude for it (Department of Education, 2010:59).It is a compulsory subject in primary schools and learners are required to pass it in order to progress to the next classes. However, many learners do not pass it in the primary schools. Table 1 above indicates that many learners are retained in the primary school because of failing it. Systemic evaluations conducted by the Department of Education in South Africa in 2011, known as "Annual National Assessment (ANA)", revealed that many schools in the Limpopo Province have many challenges in learning Mathematics (Department of Education). The results indicates that many schools in Limpopo Province are clearly struggling, for instance, 45% of schools in the poorest quintile have almost all their learners performing at the 'not achieved' level in Grade 6 Mathematics. Two schools that are the focus of this study in the Groot Letaba Circuit performed poorly in the 2010 and

2011 Annual National Assessment (ANA). The following table illustrate the results of the two primary schools which are the focus of this study:

	School A			School B		
	Grade 5	**Grade 6**	**Grade7**	**Grade 5**	**Grade 6**	**Grade 7**
2010	19.1	18.6	17.4	16.3	15.0	17.1
2011	17.3	18.3	19.1	15.3	14.6	18.2

Table 2. 2010 & 2011 ANA Mathematics results for two primary schools

The challenge facing teachers, parents and education authorities in Limpopo Province and the whole country is that learners have negative attitudes towards Mathematics (Department of Education, 2010:59).It is therefore necessary to conduct a study to investigate the factors which contribute to the negative attitudes towards Mathematics that learners have.

1.3 PURPOSE OF THE STUDY

The performance of many primary school learners in the Groot Letaba Circuit is very poor. This may deny students access to the competitive professions. Factors contributing to this poor performance have not been exhaustively studied. The purpose of this study is to examine students' attitude towards Mathematics across gender.

1.4 CONTEXT OF THE STUDY

The study will be conducted in a disadvantaged community of Makhuva Village in Groot Letaba Circuit of Mopani District, in Giyani Local Municipality. Mopani District has a population of 1,147, 356 people with five local municipalities, 19 primary schools, 95 teachers and 8550 learners. The study will be conducted in two primary schools, in Grades 1 to 7. The criteria for the selection of the sample will be explained later in this proposal. There is high rate of unemployment and poverty in this area.

The two primary schools have a combined enrolment of 997 African Black learners with 22 teachers. The two schools do not have sufficient learning resources and media facilities. All learners in the two schools learn Mathematics because it is a compulsory subject in all primary schools. The medium of instruction in the two schools, like in all schools in South Africa, is English.

1.5 STATEMENT OF THE PROBLEM

The problem in this study is the beliefs and negative attitude of learners towards learning Mathematics in primary schools in the Groot Letaba Circuit in Limpopo Province. Due to the negative attitude, very few learners pass Mathematics. Consequently, many learners are forced to repeat classes because of failing Mathematics.

1.6 AIMS OF THE STUDY

The aim of this study is to investigate the primary school learners' attitudes towards learning Mathematics in the Groot Letaba Circuit in Limpopo Province.
The following objectives will assist in achieving the main aim of this study:

(a) To investigate if there are any relationships between learners' attitudes in Mathematics and achievement in this subject.
(b) To investigate if the negative attitudes of learners towards Mathematics are gender related.
(c) To identify the factors that contributes to the low participation of learners in Mathematics in Groot Letaba Circuit schools.

1.7 RESEARCH QUESTIONS

In view of the problem and aims of the study described above, the following is the main research questions of the study:

1.7.1 How are primary school learners' attitudes towards learning Mathematics in primary schools located in the Groot Letaba Circuit in Limpopo Province?

1.7.2 Sub-questions

The above main question will be answered gradually by the following **sub-questions:**

(a) What is the relationship between learners' attitudes in Mathematics and achievement in this subject?
(b) What is the role of gender on the attitude of learners towards Mathematics?
(c) What are the factors which contribute to the low participation of learners in Mathematics in Groot Letaba Circuit schools?

1.8 SIGNIFICANCE OF THE STUDY

The findings of this study have important implications for both learners and the teachers. Currently, very few learners are taking Mathematics as a subject due to the negative attitudes of learners towards Mathematics. The findings of this study will serve to motivate learners to participate in large numbers in Mathematics. The positive attitudes of learners will develop a sense of efficacy and confidence about their ability to do well in Mathematics. Once learners are confident of their ability to succeed, they become more engaged and learn more.

The findings of this study will also provide teachers with strategies for motivating learners to learn Mathematics. The new strategies will assist teachers to create an atmosphere in which students feel in control and confident about their ability to succeed in Mathematics. Mathematics is a prerequisite for studying many careers with scientific and technological orientation. The meaningful participation of learners in Mathematics will also benefit the whole country by alleviating the shortage of scientists such as surveyors, engineers and astronomers.

1.9 DELIMITATION OF THE STUDY

Due to the design of this study, namely, case study, the study will be delimited to the learners and educators of the two primary schools in the Mopani District of the Limpopo Province. Despite the above delimitation of the study, the sample chosen and the participants who will be interviewed will be consistent with qualitative research requirements.

Many studies revealed three main problems contributing to this anomaly, namely; medium of instruction, the lack of adequately qualified Mathematics teachers and the negative attitude towards Mathematics amongst the Black learners in South Africa. Cognisant of these barriers, the present study focuses on factors which influence the attitude of learners towards Mathematics in primary schools located in the Groot Letaba Circuit in Limpopo Province.

1.10 DEFINITION OF CONCEPTS

1.10.1 Attitude

Swanepoel, Erasmus and Schenk (2008:19) states that an attitude is a degree of positive or negative feeling a person has towards a particular object, such as place, thing, situation or other person. This investigation explores the attitude of learners towards learning Mathematics and physical science.

1.10.2 Barrier

A barrier is an obstacle that prevents progress, movement, communication or access (Soanes, 2002:65, Oxford Dictionary, 2005:61).

1.10.3 Beliefs

Beliefs are convictions about the world and how it works. These beliefs are based on and reinforced by personal experience and individuals with whom an individual associates (Smit& Cronje, 2003:383).

It is also described as a feeling that something exists or is true, especially without proof (Oxford Dictionary, 2005:61). Most learners believe that Mathematics is a barrier to their academic progress.

1.10.4 Participation

Participation means taking part in an activity or event (Soanes, 2002: 649). In this study participation refers to the learners who are taking part in learning Mathematics and Physical Science in high schools.

1.10.5 Values

Values are defined as the conception of the desirable by an individual. They are concerned with what should be and form the normative standards by which human beings are influenced when choosing between alternatives (Swanepoel, Erasmus and Schenk (2008:19).

1.10.6 Strategy

The term strategy refers to a plan designed to achieve a particular long-term direction or aim of the organization (Soanes, 2002:898). Johns (2006:534) defines strategy as the process by which top executives seek to cope with the constraints and opportunities that an organization's environment poses. The term strategy is used in this study to refer to various methods used to promote the love of Mathematics.

1.11 PRELIMINARY REVIEW OF LITERATURE

Education and training of Black people in particular, during apartheid was characterized by the under-development of human potential. The teaching and learning of Mathematics were the hardest hit (Department of Education, 2001:10). Several studies have reported a number of shortcomings in the teaching and learning on Mathematics in South Africa.

In 2001 a study was conducted by the Third International Mathematics and Science Study in which South Africa participated with 41 others, reports that South African Mathematics learners came last with a mean score of 351 (Howie, 2003:12). This mean was significantly lower than the international benchmark of 513. The Third International Mathematics and Science Study conducted in 2009 revealed that Grade 8 learners once again performed poorly. Their mean score of 275 was significantly below the international mean of 487. The South African mean of 275 was lower than that of Morocco, Tunisia, and other developing countries such as Chile, Indonesia, Malaysia, and the Philippines (Naidoo, 2004:28). Another study conducted by the Third International Mathematics and Science Study conducted in 2003 similarly indicated no improvement by South African mathematics and science learners (Reddy, 2004:39). Different investigations targeting Grade 4 learners indicated that learners only obtained an average of 30% for numeracy (Department of Education, 2002). Another study was conducted by the Monitoring Learner Achievement Project organised by UNESCO and UNICEF (UNESCO/UNICEF: Monitoring Learning Achievement Project, 2005:45). In this project, Grade 4 learners from a number of African countries were assessed against a set of internationally defined numeracy and literacy learning competencies. Findings from countries including Tunisia, Mauritius, Malawi, Zambia, and Senegal, indicated that South African learners ranked fourth with an average literacy score of 48.1% and rated last with respect to numeracy, scoring at 30.0% (Department of Education, 2001:27). In the Groot Letaba Circuit of Limpopo Province, performance in Mathematics is very poor. The following table is an example of Mathematics performance in two primary schools in the Groot Letaba Circuit from 2010 to 2012:

	School A			**School B**		
Grades	**5**	**6**	**7**	**5**	**6**	**7**
2010	38.2	40.0	40.1	39.4	38.4	41.0
2011	38.3	39.3	40.0	39.5	37.4	39.0
2012	42.3	41.0	36.0	40.0	39.0	38.4

Table 1 2011-2012 Mathematics results of two primary schools

The results of the two primary schools, which are the focus of this study, reveals that the highest average results of the two schools are 41%, 40% and 43.3% in 2010, 2011 and 2012 respectively. The research findings presented above indicate that the teaching and learning of Mathematics in South Africa is in a bad state. South Africa needs qualified doctors, scientists and many other scientifically oriented professionals and with such a poor state of Mathematical teaching and learning the country will not be able to produce enough qualified doctors and scientists (Howie, 2003).

Many studies indicate that there are several reasons why the status of Mathematical teaching and learning is very poor in South Africa (Balfour, 2009; Van Heerden, 2006). According to most research findings, most Black learners in South Africa are disadvantaged by the medium of instruction. Balfour (2009:106) holds the view that the medium of instruction in Black schools is a problem not recognized by the education sector in South Africa. Van Heerden (2006:4) states that Black learners experience problems because they cannot study in their first language. English is the preferred medium of instruction in schools because indigenous languages do not have the linguistic complexity to enable them to be used in technical and scientific contexts. Most learners with lack of language ability will in all probability also be under achievers. Most of them are not fluent in English, the tuition medium of their choice. Learners lack sufficient command of English to succeed at school. This leads to problems regarding effective comprehension of the content of academic material, analysis of questions and presentations of answers. The problem of medium of instruction result in poor results amongst the Black learners and it creates a negative attitude amongst Black learners.

Various studies conducted on attitudes and problem solving in Mathematics reveal that an attitude is one of the most important elements which determine success (Bandura, 2007:03, Faridah, 2004:25, Manoah, Indoshi & Othuon, 2011: 965). A study conducted by Bandura (2007:03), identified the concept “self-efficacy” as a source of achievement in Mathematics. Bandura (2007:03) defines self-efficacy as beliefs in one’s capabilities to organise and execute the course of action required to produce given attainments.

Bandura's study revealed that predictions about possible outcomes of behaviour are critical for learning Mathematics because they affect motivation. A study conducted by Faridah, (2004:25) found that Mathematics students with high level of perseverance will not stop trying until they manage to get the answer. The study also revealed that most students of Mathematics who lack patience do not succeed because they immediately make an attempt to work out the problem without first planning any strategies. Another study conducted by Mohd and Mahmood revealed three findings, namely;

- That there is no significant difference between gender and attitude towards problem solving in Mathematics. This implies that, students' attitude towards problem solving in Mathematics is not influenced by gender. This finding was supported by a study conducted by Manoah, Indoshiand Othuon (2011:965) which established that both girls and boys showed a neutral attitude towards Mathematics curriculum.
- The second finding of this study supports Faridah, (2004:26) who suggests that patience towards problem solving is essential to achieve good results in Mathematics.
- The last finding indicates that attitudes have a significant contribution towards problem solving and Mathematics achievement.

  All above-mentioned studies indicate that the better a learner's attitude toward Mathematics is, the more successful and the higher the performance level will be for that learner.

The problem of negative attitude towards learning mathematics needs further investigation. The main aim of this study is therefore to investigate the factors which contribute to the negative attitude of learners towards Mathematics in primary schools in the Groot Letaba Circuit in Limpopo Province.

1.12 RESEARCH DESIGN AND METHODOLOGY

1.12.1 Research design

Research design is defined as “a set of guidelines and instructions that must be followed in addressing a research problem" (Mouton, 2002:107). De Vos, Strydom, Fouche& Delport 2005: 338) on the other hand define research design as the entire process of research from conceptualizing a problem to writing a narrative.

A qualitative case study design will be used in this study to explore learner attitudes and beliefs towards Mathematics in selected schools in the Groot Letaba Circuit of the Limpopo Province.

A case study is defined by Babbie (2007:298) as the in-depth collection, examination and presentation of detailed information of some social phenomenon, such as a particular participant, a village, school, family or a juvenile gang. By looking at a range of similar and contrasting cases, a researcher can understand a single-case finding, grounding it by specifying how, where and why it carries on as it does (Miles &Huberman, 2004:29).

A case study design is preferred in this study because the researcher believes that it will be capable of yielding new insights and illuminating meanings into the problem under investigation. The researcher also believes that a case study is the best design for breaking new ground for a better understanding of the factors which contribute to the negative attitude of learners towards Mathematics. The case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon that can result in a rich and holistic account of a phenomenon (Merriam, 2008:89). Another advantage of a case study is that it is narrower in scope but more exhaustive and more qualitative in nature than a survey (Tuckman, 2003:295). A research design determines the research methods to be used in a study.

1.12.2 Research methodology

Research methodology refers to the application of a variety of standardized methods and techniques in the pursuit of valid knowledge (Mouton, 2002:35). The research methodology is determined by the research approach followed in the study.
Due to the aim of the study namely, to investigate the factors which contribute to the negative attitude of learners towards Mathematics, a qualitative approach will be used in this study.

A Qualitative research is an enquiry process of understanding a social or human problem based on building a complex, holistic picture, formed with words, reporting detailed views of informants and conducted in a natural setting (Creswell, 2009:06). According to Denzin and Lincoln (2003:10), the word qualitative implies an emphasis on the qualities of entities and processes and on meanings that are not experimentally examined or measured (if measured at all) in terms of quantity, amount, intensity or frequency. Qualitative research produces descriptive data which is generally people's own written or spoken words (Brynard & Hanekom, 2005:02). Qualitative research stresses the socially constructed nature of reality, the intimate relationships between the researcher and what is studied, and the situational constraints that shape inquiry (Denzin and Lincoln, 2003:10). This is supported by Streubert Speziale and Carpenter (2003:15-17) when they indicate that a qualitative researcher believes in multiple realities, the participants' viewpoints, conducting the research in a way that limits disruption of the natural context of the phenomenon under study, acknowledgement of the participants in the research process, and reporting data in a literary style rich with participants' commentaries.

The qualitative approach is preferred in this study because it will allow the researcher to explore learners' attitudes and beliefs on Mathematics that influence learning in primary schools. In this study, the researcher is interested in the meanings of the narratives of the participants and the qualitative approach will enable the researcher to remain committed to the viewpoints of the participants in order to understand what is influencing them to display their attitudes towards Mathematics.

1.13 POPULATION, SAMPLE AND SUBJECTS

1.13.1 Population

A population of a study is the entire group of persons or set of objects and events the researcher is interested in gaining information and drawing conclusions about (Van Rensburg, 2010:150, Bless and Higson-Smith, 2000:84). A population is sometimes referred to as “target population” or universe (Bless & Higson-Smith 2010:84; Brink, Van der Walt & Van Rensburg 2006:123; De Vos, Strydom, Fouche & Delport 2005:338) .Due to the research design of this study, namely; case study design, two primary schools will be selected purposefully from 19 primary schools in the Groot Letaba Circuit.

The population of this study will be all teachers and learners from the two selected primary schools. The following table illustrates the population of this study:

	Teachers	**Learners**
Primary School A	10	455
Primary School B	12	520
Total	22	975

Table 3 Population of the study

1.13.2 Sampling

The process used to select cases for inclusion in a research study is called sampling (Terblanche & Durrheim, 2010:274; Cresswell, 2009:56). An element or set of elements considered for selection in some stage of sampling is called a sample (Babbie, 2007:190).

There are two methods of sampling, namely; probability sampling and non-probability sampling (Babbie, 2004:182). Probability sampling method is any method of sampling that utilizes some form of random selection from a list containing the names of everyone in the population being sampled (Babbie, 2004:182).

Examples of probability sampling are systematic random sampling, simple random sampling, cluster random sampling, and multi-stage sampling and stratified sampling (Babbie, 2004: 201-212). Non-probability sampling does not involve random selection. Examples of non-probability sampling are convenience sampling, snowball sampling and purposive sampling (Schultze, 2002:35).

In this study, sampling of learners will be carried out by selecting two learners in each class using purposeful sampling. The following table illustrates the sample of learners in all classes:

Grade	School A	School B	Total
1	2	2	4
2	2	2	4
3	2	2	4
4	2	2	4
5	2	2	4
6	2	2	4
7	2	2	4
Total	7	7	28

Table 4 Sample of learners

The table above indicates that 28 learners will be selected as the sample of the study using purposive sampling technique in which the researcher selects particular elements from population that will be representative or informative about the topic of interest (Cohen et.al, 2010:103; Creswell, 2003). The two schools have the total enrolment of 455 and 520 respectively.

1.14 DATA COLLECTION STRATEGIES

Two data collection methods will be used in this study, namely, an interview and participant field observation. Data collection refers to the collection of specific information about variables of interest (Jones, 2002: 461).

1.14.1 Interviews

Baynard and Hanukah (2005:32) describe an interview as *a* method of collecting data that allows the researcher to ask questions to the respondents. There are two types of interviews, namely: structured and unstructured interviews. In structured interviews the questions, order and wording, and their sequence are fixed and identical for every respondent while in unstructured interview, the interviewer does not follow any structure at all, but covers as much ground as possible on a given topic with the respondent (Cohen, Manion & Morrison, 2002:270, Brynard & Hanekom, 2005:45). A structured interview will be used in this study because it requires less time for the administration of the interview as a whole. A **closed-ended or structured interview** will be used to explore the following:

(a) ***Attitudes***: The main factors which contribute to the negative attitude of learners towards Mathematics in primary schools in the Groot Letaba Circuit in Limpopo Province.
(b) ***Relationships***: The relationships between learners' attitudes in Mathematics and achievement in this subject.
(c) ***Gender***: Whether the negative attitudes of learners towards Mathematics are gender related?
(d) ***Participation****:* The factors which contribute to the low participation of learners in Mathematics in Groot Letaba Circuit schools.
(e) ***Strategy***: An effective strategy that will enhance the love of Mathematics in Groot Letaba Circuit schools. An interview is preferred in this study because

- it will provide me with more information in greater depth;
- I will be able to establish relationships with the respondents;
- it will offer me an opportunity to probe and also to restructure questions if necessary and
- Because they usually have a high response rate than questionnaires.

1.14.2 Field Observation

Observation involves getting close to the people and making them feel comfortable enough with your presence so that you can observe and record information about their lives (Bernard, 2006: 342). An observation is preferred in this study because it will assist me in understanding what occurs in real life as opposed to a highly contrived or artificial settings (Bernard, 2006:343). Learners' behaviour in the classroom will be observed as it occurs naturally. Another advantage of observation is that when I use observation there will not be any need to worry about self-report bias, social desirability and response set and the information is not limited to what can be recalled accurately by the subjects(Bernard, 2006:343).

Observation is also independent of respondent's willingness to respond. In this study I will adopt the non-participant observer role because I don't want to be engaged in activities that distracts me from data collection. I will observe the learners for one day in their classrooms during Mathematics periods. learning and discussions.Since the focus of this study are the attitudes of learners towards learning Mathematics, my observation will focus on the following variables:

(a) ***Affective attititudes***: This is basically the evaluative element in an attitude such as feelings and emotions, which the attitude holder judges. Since attitudes are accompanied by positive or negative feelings, I will observe how they naturally express their feelings and emotions while learning Mathematics.

(b) ***Behavioural attitudes***: This refers to the behavioural aspect of attitudes. It involves a person's intentions to act in a certain way towards an event and these intentions are related to the affective component (Wetherell (1996) in Mathonsi, 2006:12). This suggests that one who has some emotional reaction to Mathematics might be assumed to act on this basis. I will therefore observe their behaviour during Mathematics learning.

(c) ***Cognitive attitudes*:** Attitudes also have a cognitive component. This incorporates knowledge and beliefs about the process (Gagne (1985) in Mathonsi, 2006:12). An individual will have a positive attitude towards an aspect he fully understands and knows. In this regard I will observe whether they understand what they are learning during the period of Mathematics.

1.15 DATA ANALYSIS

Once data collection has been completed, the researcher should begin the process of data analysis and interpretation (Bless & Higson-Smith, 2010:137). The purpose of data analysis is to:

- describe the data clearly,
- identify what is typical and atypical of the data,
- bring to light differences, relationships and other consistent patterns existing in the data and
- Ultimately answer research questions or test hypotheses (Charles, 2005:118). Data analysis also allows the researcher to generalise the findings from the sample used in the research to the larger population (Bless & Higson-Smith, 2010:137).

In this study the data will be analysed according to Tesch Method (2002:176) of interpreting the data in the basic sense of reflecting on the data until a better understanding of what is meant is achieved.

Steps	Activity
1	The information collected is firstly organized. Once I have organized and prepared the data, I will read through all the transcriptions carefully and make notes.
2	I will read through all the transcripts of the interview. I will then consider the content or underlying meaning of the information and write down my thoughts on the margins.
3	I will then make a list of all the topics, put similar topics together and form these topics into columns that might be grouped as major topics, unique topics and leftovers.
4	I will take the list of topics and assign to each topic an abbreviated and identifiable code. I will then take the list of topics with abbreviated codes and go back to the transcribed data and write the codes next to the data segments that correspond with the code.
5	I will write the most descriptive wording for my topics and turn them into themes or categories.

6	I will make a final decision on the abbreviation for each theme or category and alphabetise these codes.
7	I will assemble the data material belonging to each theme or category in one place and do a preliminary analysis.
8	I will finally start interpreting and reporting the research findings.

1.16 ETHICAL CONSIDERATIONS

I will also meet the educators and learners who will participate in the study to explain my research study. In accordance with ethics rules, I will explain to them that there is no need for special arrangements during data collection that might interrupt their normal teaching lessons. The main objective is to arrange a place where I will interview the participants. I will request their personal time-table so can see the appropriate times for the interviews. I will provide them with consent letters and request them to read and sign them to read and sign them.

Ethics is a matter associated with morality and ethical guidelines serve as standard which form the basis for the research to evaluate one's conduct (Babbie, 2001:118). In this study the researcher will adhere to the following most important ethical standards of research described by Babbie (2007:118), Bless and Higson-Smith (2010:100) and Welman, Kruger, and Mitchell (2006:201):

(a) ***Informed consent***: In this study respondents will be informed about the purpose and importance of the study, the benefit of participation and they will be requested to sign a consent form. As Bless and Higson-Smith (2010:101) assert, I will assure the respondents that the research data will only be used for the stated purposes of the research.

(b) ***Voluntary participation***: The respondents will be informed of their right to participate voluntarily. Participants will be free to terminate their participation at any stage without any consequences.

(c) ***Right to privacy (confidentiality)****:* Participants will be assured of their anonymity and in this regard I will assure participants that their names or identities and the name of the school will not be disclosed.

Confidentiality will also be ensured by protecting all data gathered and by not making the data available to outsiders. All the hard data will be stored in a locked cabinet and the data will be destroyed after completion of analysis. All electronic data will be stored on a computer requiring password access.

(d) ***Protection from harm***: I will also assure the respondents that their participation in this research will not cause them any physical discomfort, humiliation and emotional stress.

1.17 RESEARCH STRUCTURE

Chapter one will focus on the outline of the background to the problem, the problem statement, research questions, the significance of the investigation, aims and objectives, delimitation, theoretical framework, description of the methods of investigation and definition of concepts.

Chapter two will offer a review of the literature and the theoretical background of the investigation. Primary and secondary sources in relation to the topic will be used. The literature review will concentrate on a wide review of relevant writings such as the latest articles, journals, and major books on the subject, monographs and dissertations published nationally and internationally.

Chapter three will focus on research design. Here the methods of investigation including specific procedures, research population and sampling, instrumentation, data collection and treatment will be outlined and described.

Chapter four will concentrate on data analysis and interpretation of data. In this chapter, the responses of the respondents will be presented and elucidated by means of charts and tables, which will be accompanied, by a detailed analysis and interpretation.

Chapter five serves as a synthesis and will comprise summary of each chapter, summary of findings as well as the conclusions or results. Finally the recommendations for the future are provided.

1.18 CONCLUSION

The proposal presents the plan of the investigation on the attitudes learners towards Mathematics, namely; the background, problem formulation, aims of the study, research questions, delimitations, preliminary literature, research design and methodology, sampling, ethical considerations, ethical considerations, research framework and time frame of the study of the study. The main purpose of the study is to promote the love of Mathematics in our schools. The next chapter will focus on literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter dealt with the contextualization of the study. In this chapter, various literature sources will be reviewed in order to explore the influence of attitudes on Mathematics learning in the primary schools. Literature review is a review of the existing scholarship or available body of knowledge, which helps the researchers to see how other scholars have investigated the research problem that they are interested in (Mouton, 2001:87). Literature review will enable me to learn how other scholars have demarcated similar problems, collected data, theorized and conceptualized issues related to poor performance in Mathematics. The literature review will include the findings and suggestions yielded and the relevant literature will rationalize the framework of the current study.

Performance in Mathematics in the Groot Letaba Circuit, as reflected by Mathematics results in table 1 below, has remained poor over the years (Groot Letaba Circuit, 2010-2012 Results Analysis). This is cause of major concern by parents, teachers, the Department of Education and learners themselves. It is therefore necessary, to investigate the major factors which contribute to this anomaly.

Grade	**2010**	**2011**	**2012**
5	37.4	35.4	40.3
6	39.5	39.3	41.4
7	38.3	39.4	42.3

Table 1 Mathematics results in Groot Letaba Circuit

(Department of Education, Groot Letaba Circuit, 2010-2012 Results Analysis)

Literature review reveals that there are several factors which contribute to poor performance in Mathematics (Köğce, Yıldız, Aydın & Altındağ. 2009).

Figure 1 below, illustrates the factors that influence learners' performance in Mathematics, namely, students' attitudes, behaviour, motivation, education of parents and their economic status and school based factors such as availability and usage of teaching and learning facilities, school type and teacher characteristics. Figure 1 below, indicates the factors that influence learners' performance in Mathematics as independent variables, the government policy as intervening variable while performance in Mathematics is a dependent variable.

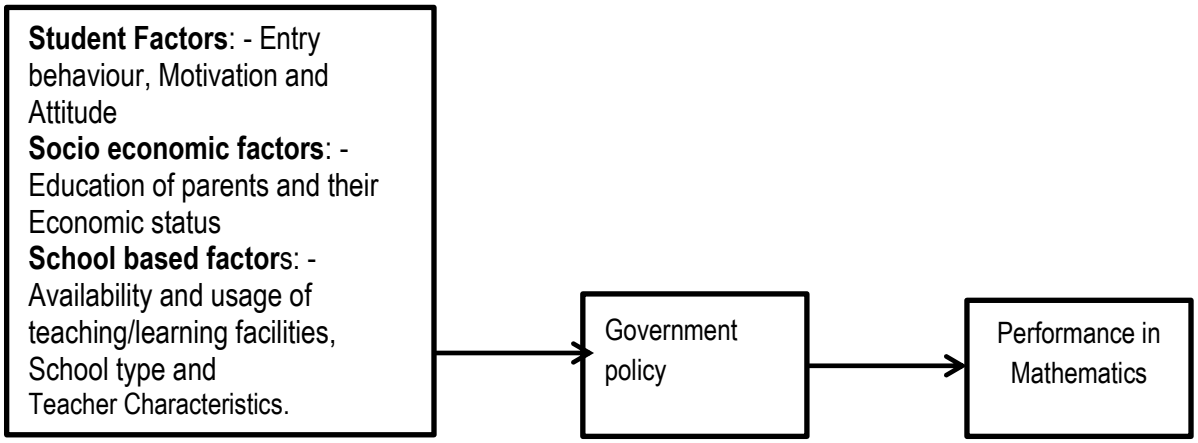

Figure 1 Factors which contribute to poor performance in Mathematics (Köğce, Yıldız, Aydın & Altındağ, 2009)

Literature review also reveals that learners' attitudes play a vital role in determining their performance in Mathematics (Köğce, Yıldız, Aydın & Altındağ. 2009; Tahar, Ismail, Zamani, & Adnan. 2010; Klein, 2004). When reviewing literature on learners' attitudes towards Mathematics, it reveals that several factors play a role in influencing learners' attitudes. These factors can be categorised into three distinctive groups, namely; factors associated with the students themselves, factors that are associated with the school, teacher and teaching and the factors from the home environment and society. It is therefore necessary to explore learners' **attitudes** towards Mathematics and also necessary to understand the concept "**attitudes**", before exploring the possible link of learner attitude to Mathematics.

2.2 THEORETICAL PERSPECTIVE

This investigation is based on **the functionalist theory of attitudes** by Daniel Katz (1960). All the views in this section are an exposition of Katz's Functionalist theory of attitudes. Katz (1960, in Swanepoel, Erasmus, and Schenk, 2008:19), defines an attitude as a degree of positive or negative feeling a person has towards a particular object, such as place, thing, situation or other person. There are three components of attitudes, namely; affective attitudes, behavioural attitudes and cognitive attitudes, each of them is briefly discussed below:

(a) **Affective attitudes**

According to Rajeckitt (1990 in Mathonsi, 2006:11) attitudes are accompanied by positive or negative feelings. This is basically the evaluative element in an attitude (namely, feelings and emotions), which the attitude holder judges, for example, Mathematics to be good or bad. What this suggests is that attitudes are often subconscious and are not based on rational explanation. The affective component of attitudes influences feelings and emotions irrationally.

(b) **Behavioural attitudes**

Wetherell (1996 in Mathonsi, 2006:12) explains that the behavioural aspect of attitudes involves a person's intentions to act in a certain way towards an event and these intentions are related to the affective component. This suggests that one who has some emotional reaction to Mathematics might be assumed to act on this basis.

(c) **Cognitive attitudes**

Thirdly, attitudes may have a cognitive component. This incorporates knowledge and beliefs about the process. According to Gagne (1985 in Mathonsi, 2006:12) an individual will have a positive attitude towards an aspect he fully understands and knows. For example, if learners were provided with free-flowing information about Mathematics, they would be able to quickly grasp the new issues. Thus they will feel more confident because they have a better chance of understanding what is expected of them.

An attitude is therefore, a fairly stable emotional tendency to respond consistently to some specific object, situation, person, or a category of people. For example, mathematics could be seen as either favourable or unfavourable towards the learner's future. The general view is that when attitudes are hostile or negative, problems are created out of opportunities, which alienate and irritate other people. For example, learners with negative attitudes towards Mathematics will refuse to write tasks such as homework and class work. People with positive attitudes maintain a sense of perspective which allows them to draw positive elements out of each situation (Katz, 1960, in Mathonsi, 2006:10). Attitudes are a function of what we think and what we feel and they are a product of a related belief and value (Johns, 2006:132). An individual will for example have a positive attitude towards an aspect he fully understands and knows. For example, if a learner believes that Mathematics is important for his future (belief), and the learner values his or her future (values), we can conclude that that learner will have a favourable attitude towards Mathematics (attitude). Attitudes often influence our behaviour toward some object, person or group, for example, a positive attitude towards Mathematics will influence a learner to work hard and pass Mathematics at school (behaviour).Katz (1960, Mathonsi, 2006:12) also indicates that the behavioural aspect of attitudes involves a person's intentions to act in a certain way towards an event and these intentions are related to the affective component.

The main challenge of the teachers is to promote the love of Mathematics so that learners realize the importance of Mathematics.

2.3 BENEFITS OF LEARNING MATHEMATICS

The South African government's new National Curriculum Statement, in line with its earlier White Paper on Science and Technology makes it clear that adequate skills and knowledge of Mathematics are believed to be a vital component of successful contemporary life and socio-economic development (Department of Education, 2003; Department of Arts, Culture, Science and Technology, 1996). Apart from the economic benefits of better preparing people for the numeracy demands of modern work place and raising the overall skill levels of the work force, there are also social benefits tied to improving access for larger numbers of people to

post-school education and training opportunities and laying stronger foundation to skills for lifelong learning(Manoah, Indoshi & Othuon, 2011:966).

In an ever-changing society, it is essential that all learners passing through the primary school acquire a functioning knowledge of Mathematics that empowers them to make sense of society (Department of Education, 2003:09). A suitable range of Mathematical process skills and knowledge enables an appreciation of the discipline itself. It also ensures access to an extended study of the Mathematical Sciences and a variety of career paths. Mathematics is therefore necessary for any learner who intends to pursue a career in the Physical, Mathematical, Computer, Life, Earth, Space and Environmental Sciences or in Technology. The study of Mathematics contributes to personal development through a deeper understanding and successful application of its knowledge and skills, while maintaining appropriate values and attitudes (Department of Education, 2003:09). Therefore, Mathematical competence provides access to rewarding activity and contributes to personal, social, scientific and economic development. Mathematics enables learners to communicate appropriately by using descriptions in words, graphs, symbols, tables and diagrams, use mathematical process skills to identify, pose and solve problems creatively and critically, organise, interpret and manage authentic activities in substantial mathematical ways that demonstrate responsibility and sensitivity to personal and broader societal concerns, work collaboratively in teams and groups to enhance mathematical understanding, collect, analyse and organise quantitative data to evaluate and critique conclusions and engage responsibly with quantitative arguments relating to local, national and global issues (Department of Education, 2003:09).

Despite this apparent need, the performance of Mathematics is very poor in many schools.

2.4 FACTORS WHICH DETERMINE LEARNERS' ATTITUDES TOWARDS MATHEMATICS.

There are several factors determine learners' attitude towards Mathematics. These factors can be categorised into three distinctive groups, namely; factors associated with the students themselves, factors that are associated with the school, teacher and teaching and the factors from the home environment and society.

Thirdly, factors from the home environment and society also affect students‟ attitude towards Mathematics. Factors such as educational background of parents, occupation of parents (Köğce et al, 2009:294) and parental expectations play a crucial role in influencing students‟ attitude towards Mathematics (Tobias, 2003:10). Due to these several factors students have different attitude towards Mathematics. More often, the public image of Mathematics is labelling it as a difficult, cold, abstract, theoretical and ultra-rational subject (Ernest, 2004:12). This section will focus on these factors.

2.4.1 Factors associated with the students themselves

There are several factors associated with the learners, which determine the learners' attitude towards Mathematics. Some of these factors include learners' attitude and motivation towards learning (Köğce, Yıldız, Aydın & Altındağ. 2009:293), learners' attitude and gender, achievement in Mathematics and attitudes**,** anxiety towards Mathematics, student's self-efficacy and self-concept, extrinsic motivation (Tahar, Ismail, Zamani, & Adnan. 2010:479) and experiences at high school (Klein, 2004:235). The following are the factors associated with the learners' themselves:

(a) Learners' attitude and motivation towards learning

Katz (Swanepoel, Erasmus, and Schenk, 2008:19), defines an attitude as a degree of positive or negative feeling a person has towards a particular object, such as place, thing, situation or other person, while Bohner & Wänke (2002:39) define it as a summary evaluation of an object of thought.

Attitudes are cognitive (beliefs, thoughts, attributes), affective (feelings, emotions) and behavioural information (past events, experiences) (Maio, Maio & Haddock, 2010:13).Learning or studying could for example be seen as either favourable or unfavourable towards the learner's future.

In education, attitude is one of the important elements which determine students' success. A considerable amount of literature has been published on attitudes and problem solving in Mathematics (Effandi & Normah, 2009: 236; Kandemir & Gűr, 2009:1629; Mapolelo, 2008:339). Attitude towards Mathematics plays a crucial role in the teaching and learning processes of Mathematics (Furinghetti & Pekhonen, 2002:40). It effects students' achievement in Mathematics. Usually, the way that Mathematics is represented in the classroom and perceived by students, even when teachers believe they are presenting it in authentic and context dependent way, stands to alienate many students from Mathematics (Barton, 2000:800). Researchers concluded that positive attitude towards Mathematics leads students towards success in Mathematics (Effandi & Normah, 2009:240). According to Effandi and Normah, students' attitudes towards Mathematics are very much correlated to their attitude towards problem solving in general. Effandi and Normah add that negative attitudes need to be overcome, so that students do not suffer from poor problem-solving skills in future. Their views are supported by O'Connell (2000:22) who contends that students must have positive attitude towards problem solving if they are to succeed. O'Connell asserts that solving problems requires patience, persistence, perseverance and willingness to accept risks, while Papanastasiou (2000:40) claims that students with positive attitude towards Mathematics will generally excel at it. McLeod, 2002:15) asserts that there is a link between students' attitudes and their achievement in Mathematics. According to Cobb (2006:20) there is a relation between beliefs and learning of Mathematics and that "students reorganize their beliefs about Mathematics to resolve problems".

A study conducted by Mahmud, (2001:68) revealed that excellent students have high level of willingness to solve Mathematics problems compared to average and weak students. Took & Lindstrom (1998:19) on the other hand, indicates that students with high level of positive attitude in Mathematics will ultimately have high level of success in life.

However, some studies show that students have a relatively positive attitude towards Mathematics (Tezer & Karasel, 2010:5808; Yilmaz, Altun, & Ollkun, 2010:4502; Fan, Quek, Yan, Mei, Lionel & Yee, 2005:07).

(b) **Attitude and gender**

Gender differences are a recurrent theme throughout the literature in academic studies in general and in Mathematics studies in particular. Mathematics is often considered to be a domain in which boys are higher achievers, both in terms of attitudes and self-concept. Sometimes, Mathematics is also considered as very important and largely masculine subject (Ernest, 2004:120). Several studies gives evidence that compared to boys, girls lack confidence in doing Mathematical sums and viewed Mathematics as a male domain. The role of gender in influencing Mathematical achievement is a very controversial issue. A study conducted by Moreno and Mayer (2009:356) on gender differences in responding to open-ended problem solving questions suggest that males perform better than females on solving a problem (Ernest, 2004:120). This is supported by Fennema's (2005:304) findings (2009:236) that males perform better than females when tasks involve the cognitive skills used in Mathematics. The above findings are corroborated by the studies conducted by Gallagher and Lisi, (2004:205) and Patterson, Decker, Eckert, Klaus, Wendling and Papanastasiou, (2003:93) which revealed that male students are able to solve implicit problems and problems that do not require specific strategies because they have a more positive attitude towards Mathematics than female students.

The above findings are however opposed by Mokhtar (2000:30), who discovered in his studies that there was no significant difference in mean problem-solving achievement between male and female students. Mokhtar is supported by Effandi and Normah (2009:28) and Popoola (2000:35) who reported that there is no significant difference in students' attitude towards problem solving with respect to gender. Arnot, David and Weiner (2009:55), adds that girls are often discouraged from Mathematical work in their primary years. They therefore dislike it in the secondary years and drop it at high grade levels in far greater numbers than boys. Consequently, fewer women are employed in industry in posts requiring

Mathematical ability (Arnot, David and Weiner, 2009:56). However, Leder and Taylor, (2005:275); Leeson, (2005:40); Malone and Miller, (2003:30), indicate that the gender differences in Mathematics achievement is not conclusive because there are so many other factors which contribute towards Mathematics achievement, such as poor attitude and lack of interest. This implies that gender based differences are due to the individual's perception of own abilities and the sex role (Schiefele & Csikszentmihalyli, 2005:11).

(c) **Achievement in Mathematics and attitudes.**

Several studies have been undertaken to try to reach an understanding of the relationship between student attitudes towards Mathematics and academic achievement (Mato, De la Torre, 2010: 197–208, Mohamed & Waheed, 2011; 277–281, Nicolaidou & Philippou, 2003: 1–11 & Fraser & Kahle, 2007:1891–1909). With regard to grade, these associations become stronger among older students (7th to 12th grade). However, more recent studies point to a positive correlation between student attitudes towards Mathematics and student academic achievement. The findings are supported by the results obtained by Nicolaidou and Philippou [6] which reveal significant correlations between attitudes and performance. The findings revealed that students having positive attitudes achieved better.

According to Nicolaidou and Philippou (2003:10), negative attitudes of learners towards Mathematics are the result of frequent and repeated failures or problems when dealing with Mathematical tasks. These negative attitudes may become relatively permanent. These authors indicate that when children first go to school they usually have positive attitudes towards Mathematics. However, as they progress to higher grades in the primary school, their attitudes become less positive and frequently become negative. K¨o˘gce, Yıldız, Aydın, and Altında˘g (2009:291) found significant differences between younger and older students' attitudes towards Mathematics with grade 6 learners having lower attitudes than grade 6 learners. There are a number of factors which can explain why attitudes towards Mathematics become more negative with the school grade, such as the pressure to perform well, over demanding tasks, uninteresting lessons and less than positive attitudes on the part of teachers (Nicolaidou & Philippou, 2003:10).

Nutritional deficiencies in early childhood are also associated with poor cognition and poor achievement in mathematics in later years. A number of studies have found that children who experienced iron deficiency early in life, continued to demonstrate lower academic performance during their school years (Black, 2003:04). Zinc deficiency has been linked with low activity and depressed motor development among most children and Vitamin B-12 deficiency has been associated with cognitive problems. Iron deficiency leads to reduced oxygen carrying capacity, impact immunity, growth and development and children continue to demonstrate lower academic performance during their school years (Black, 2003:07).

(d) **Mathematics anxiety of learners.**

Another major source of negative attitudes towards Mathematics is Mathematics anxiety of learners. Steele and Alfred (1998:18) indicate that one of the sources of Mathematics anxiety is the teaching approach of "explain-practice-memorize." The Mathematics teacher needs to be creative in his teaching methods, so students do not lose interest. This idea is supported by a study conducted by Pyne, Bates, and Turner (1995). They taught elementary Mathematics to college students who did not reach the minimum requirements to be enrolled in a course they needed.

2.4.2 Factors that are associated with the school, teacher and teaching

Some of the factors that influence attitudes are teacher's attitude toward Mathematics, difficulties with the language of Mathematics and teaching (Ford, 2004:314, Karp, 2001:268).

(a) Negative attitude of Mathematics teachers towards Mathematics

The negative attitudes and teachers beliefs towards Mathematics also contribute to the negative attitudes of learners towards the subject (Cater & Norwood, 2007:65). Teachers that are afraid of Mathematics pass that on to their students (Furner & Duffy, 2002). If the teacher does not value Mathematics, his learners certainly cannot be expected to value Mathematics either.

Furner and Duffy (2002:12) indicate that there are many things the Mathematics teacher can do that will provoke his learners to dislike Mathematics. The teacher may be perceived as not caring about learners because he is unwilling to give extra help to students who need it. The learners need to know that their teacher is able and willing to help them. The teacher may become angry or frustrated when his class does not understand the problems. The teacher may also have unrealistic expectations of his learners. Also, giving written work every day, insisting there is only one correct way to complete a problem, and assigning Mathematics problems as punishment for misbehaviour can cause students to dislike Mathematics because no one enjoys discipline (Furner & Duffy, 2002). Making learners do Mathematics as a form of discipline could very likely cause learners to dislike Mathematics.

(b) Difficulties with the language of Mathematics and medium of instruction

Many studies revealed that the language of Mathematics creates a negative attitude in some learners. It is very important to remember that Mathematics is about numbers and figures, it focuses on patterns and relations, has a Mathematical language that the learner must become acquainted with (Landsberg, 2005:112). Many of the children from the middle and low-ability groups appear to struggle with the language of Mathematics (Ashby, 2009:10). Some children find it difficult to read a question and understand it at the same time, even though all the information that they required was written in front of them. Mathematics can appear as a foreign language to many people. It has its own alphabet, comprised of numbers and symbols, and is constructed with a complicated syntax. Just like a foreign language, it is easy to misinterpret. Some children have significant problems translating this language into something useful that they can work with. For some children, it seems that the Mathematical processes themselves are not problematic, it is instead a communication issue, and how they are able to interpret Mathematical language.

Many studies revealed that most Black African learners in South Africa developed a negative attitude towards learning because of the medium of instruction. Balfour (1999:106) holds the view that the medium of instruction in townships schools is a problem not recognized by the education sector in South Africa and Van Heerden (1996:4) states that Black learners experience problems because they can’t study in their first language.

He states that English is the preferred medium of instructions in schools because some indigenous languages do not have the linguistic complexity to enable them to be used in technical and scientific contexts. Moreover, many parents chose English as the language of teaching and learning because they see it has a cultural capital that will ensure jobs for their children. Most learners with lack of language ability in the language of teaching and learning (LOLT) will in all probability also be under-achievers. Most of them are not fluent in English, the tuition medium of their choice. They lack sufficient command of English to succeed at school. This leads to problems regarding effective comprehension of the content of academic material, analysis of questions and presentations of answers.

Most learners struggle to communicate in English and will put them at a disadvantage, since that is the language used in teaching and learning. McKay (2012: 56) too, argues that children learn better when they are taught through a language they know well. Hence, she points out that while the Language-in-Education Policy (Department of Education, 1996) grants parents and school governing bodies a significant role in the decision of the language of the school, more needs to be done to make parents aware of the benefits of mother language education.

(c) Teaching and attitudes towards Mathematics

The teaching materials used by the teacher, teachers' classroom management, teachers' content knowledge and personality, teaching topics with real life enriched examples, other student's opinions about Mathematics courses (Yilmaz, Altun & Olkun, 2010:4503), teaching methods, reinforcement (Papanastasiou, 2000:30) and receiving private tuition (Köğce et al, 2009:294) also determine the learners' attitude towards Mathematics. Mathematical resources also contribute to improving teaching and learner's attitude in Mathematics. The term 'Mathematical resource' is defined here as any form of specific Mathematical apparatus (structured or unstructured), image, ICT, game, tool, paper, or everyday material which could be utilised to provide a Mathematical teaching or learning aid (Drews, 2007:21).

In the area of Mathematical learning, Jerome Bruner's (1964) three modes of representing our experiences are considered important to the development of children's understanding:

- the inactive mode: It involves representation of ideas through undertaking some form of action (such as manipulating physical objects);
- the iconic mode: It involves representing those ideas using pictures or images; and
- the symbolic mode: It involves ideas represented through utilising language or symbols (Drews, 2007:21).

According to Bruner (2006:34), these modes of representation are mutually supportive in assisting the storage of 'pictures in the mind'. This entails the development of a mental 'storage system' which allows learners to make predictions and to retrieve relevant information from past experiences to extrapolate to new situations. The use of physical resources, models and images in Mathematics teaching and learning relate well to the inactive and iconic modes of representation, with mental imagery and language supporting the understanding and use of symbols (Drews, 2007:25). Edwards (2008:18) argues that Mathematical understanding is brought about for all children by connections being made between these modes of representation. Haylock and Cockburn (2003:35) suggest that the network of connections between concrete experiences, pictures, language and symbols could be significant to the understanding of a Mathematical concept. Central to this is the notion that 'when children are engaged in Mathematical activity, they are involved in manipulating some, or all, of the following: concrete materials, symbols, language and pictures' (Haylock & Cockburn, 2003:03). It is this act of manipulation that allows for connections to be made through the different experiences. Moyer (2001:176) supports this by stating that it is the active manipulation of materials that 'allows learners to develop a repertoire of images that can be used in the mental manipulation of abstract concepts'. It is therefore important that Mathematics teachers should be provided with sufficient resources.

Use of calculators in the learning of Mathematics can result in increased achievement and student attitudes. Studies have consistently shown that the use of thoughtful calculators improves student Mathematics achievement and attitudes towards Mathematics. Hembree and Dessart (2006:85) concluded that the use of hand-held calculators improves student learning. One valuable use for calculators is as a tool for exploration and introducing Mathematical content. By reducing computation time and providing immediate feedback, calculators help student focus on understanding their work and justifying and justifying their methods and results (Hembree & Dessart, 2006:86). The graphing calculator is particularly useful in helping to illustrate and develop graphical concepts and in making connections between algebraic and geometric ideas. The calculators should also be used during tests and examinations in order to accurately reflect their meaningful Mathematical performance. Not to do so is a major disruption in the students' usual way of doing Mathematics and an unrealistic restriction because when they are away from the school setting, they will certainly use a calculator in their daily lives and in the work place (Hembree & Dessart, 2006:86).

The use of concrete materials is recommended for teaching and learning Mathematics. Long-term use of concrete materials is positively related to increases in student Mathematics achievement and improved attitudes towards Mathematics (Drews, 2007:25). Research suggests that teachers should use manipulative materials regularly in order to give students hands-on experience that helps them construct useful meanings for the Mathematical ideas they are learning (Drews, 2007:25). According to the research findings, the use of the same materials to teach multiple ideas over the course of schooling shortens the amount of time it takes to introduce the materials and helps students see connections between ideas. The findings also indicate that the use of concrete material should not be limited to demonstrations. It is also essential that students use materials in meaningful ways rather than in a rigid and prescribed way that focuses on remembering rather than on thinking.

Bekker, Denerouti, Deboer and Schaufeli (2003:76) indicates that poor and lack of resources (like textbooks and adequate infrastructure) preclude actual goal accomplishment, which is likely to cause failure and frustration and may therefore lead to withdrawal from work and reduce commitment. In most schools, about three pupils share one text book. Sometimes books are delivered late due to late requisition, lack of transport or lack of capacity on the part of suppliers. As from 2012 the Limpopo Department of Education is in a serious textbooks crisis. Since January 2012, many schools have not yet received textbooks. In June 2012 an investigating team led by Professor Mary Metcalfe from University of Witwatersrand was appointed by the National Department of Education to verify how many textbooks Limpopo schools have received (Govender & Shoba, 2012:01). The team found that by mid-year (July 3, 2012), only 48% had been delivered to the schools (Department of Education, 2012:74).

Learners' attitudes can also be improved by creating an effective learning environment. Creating an ideal Mathematics learning environment begins with the teacher understanding students as learners. It is not only important for a teacher to have content knowledge, but also to develop awareness of how individual students learn (National Research Council, 2000:17). Teachers must make appropriate choices with regard to pedagogy to provide learning opportunities such that students are able to construct their Mathematical knowledge (National Research Council, 2000:17). Teachers can create environments where knowledge is constructed by the student. This environment enables students to build their Mathematical knowledge and understanding of the subject.

Teachers should create environments where knowledge is constructed by the student. This environment enables students to build their mathematical knowledge and understanding of the subject. The classroom is defined as a constructivist classroom (Capraro, 2001:45). A 'mild' version of constructivism, originating in the work of Jean Piaget, claims that knowledge is actively constructed by the learner and not passively transmitted by the educator (Boudourides, 2008:48). The emphasis is placed on the activity of the individual and reflection of the result of the activity. Students use their current knowledge to construct new knowledge. What they know and believe at the moment affects how they interpret new information

(NRC, 2000:25). Students use a process of assimilation and accommodation. Assimilation is where new knowledge is created by building on, or reflecting on knowledge gained previously. Accommodation is when old knowledge beliefs are reshaped to accommodate new experiences (Gadanidis, 2004:93).

2.4.3 The factors from the home environment and society.

The negative attitudes of parents also contribute to the negative attitudes of learners towards the Mathematics. Parents that are afraid of Mathematics pass that on to their students (Furner & Duffy, 2002). It is very difficult for learners to like Mathematics when their parents did not do well in Mathematics themselves, and thus do not understand it or do not think it is important. Learners could see their parents as having a job and doing well without a great love for Mathematics and think that they will be successful without an appreciation of Mathematics as well.

Education does not exist in a vacuum. It reflects the broad social, economic and political structure of the country it serves and student achievement is also influenced by the parents' socio-economic status. The occupation of parents is an important variable in determining the socio-economic background, because so many aspects of economic, political and social life such as income, power and status in society are reflected by it (Legotlo, 1988:12). Hyland (1998:02) argues that poverty and fear of a lack of job opportunities can undermine young people's motivation Hyland further asserts that some learners argue that going to school is not important because learning does not guarantee employment and for this reason, they are not motivated to attend school regularly.

2.5 ENHANCING LEARNERS' ATTITUDES TOWARDS MATHEMATICS

All the stakeholders of the school are responsible for enhancing the learners' attitudes towards Mathematics. The following can be done to develop positive attitudes of leaners towards Mathematics:

2.5.1 Development of learners' patience, commitment and confidence towards Mathematics

A Mathematics educator should cultivate qualities of positive attitudes towards Mathematics such as patience, commitment and confidence in his or her learners. Patience towards problem solving is essential to achieve good results in Mathematics. A study conducted by Faridah (2004:45) revealed that students with high level of perseverance will not stop trying until they manage to get the answer and they will continue to work on a problem until they succeed in solving it. The study also revealed that most students fail to resolve Mathematical problems because they immediately make an attempt to work out the problem without first planning any strategies to do so. This implies that most underperforming students have lack of patience to carefully read and understand the questions given.

Students' commitment in Mathematics is defined as students' motivation to learn Mathematics, confidence in their ability to succeed in Mathematics and their emotional feelings about Mathematics (Education Matters, 2008:20). Students' commitment in Mathematics plays a key role in the acquisition of Mathematical skills and knowledge (Education Matters 2008:26). Confidence towards problem solving also plays a significant role in Mathematics achievement and is one of the factors that influence students in Mathematics achievement. Bandura refers to such confidence as "self-efficacy" (Andrew, Salamonson & Holcomb, and 2009:218). According to Bandura, an individuals' self-efficacy expectation of their individual ability to successfully perform a given task is a reliable predictor of whether or not they will attempt the task, the amount of effort they will expend and their level of perseverance in the face of unanticipated difficulties (Andrew, Salamonson & Holcomb, and 2009: 218).

This is confirmed by a study conducted by Tooke and Lindstrom, (2008:136), who indicate that confidence in learning Mathematics and problems solving is essential to ensure excellent achievement.

2.5.2 The role of principals in developing learners' and teachers' positive attitudes towards Mathematics

There are other studies that reveal that the development of positive attitude towards Mathematics is the role of school principals. Christie (2008:291), for example, indicates that there is a dominant belief in government and educational circles that principals are in a better position to add value and make a difference in the performance of schools. However, the work load of principals is becoming more and more unmanageable, and many principals lack the time for and an understanding of their leadership task (Caldwell, 2002:09). Traditionally the role of a school principal is that of a manager and administrator (Pretorius, 2008:105). There was a change during the 1980's, which called for a shift in emphasis from principals being managers or administrators to instructional or academic leaders. As instructional leaders they are required to be involved in direct supervision of the instructional process and had to ensure that their schools remained focused on learning and teaching. The role of a learning expert remains important today, but in addition principals are now expected to be not only learning experts but also experts in knowledge areas (Johnson, 1997:79-80). This role requires principals to understand contemporary theories of learning.

Principals should influence the quality and attitudes of Mathematics education through arranging for meaningful professional development, mentoring teachers in order to strengthen the focus on Mathematics instruction, working to align curricular materials, technology, and assessments with goals for Mathematics education, establishing effective processes for analysis and selection of mathematics instructional materials (NCTM, 2000:15). Cauley, Van de Walle, and Hoyt (2003:12) recommended practices that principals should use to promote implementation and positive teachers attitude towards Mathematics, namely; encourage Mathematics department chairs to become instructional leaders, provide time for teachers to observe one another's' teaching and collaborate in the design and evaluation of

instruction, provide quality professional development focusing on specific classroom issues related to teaching Mathematics, become knowledgeable about the Mathematics Standards, supply teachers with professional Mathematics journals and books, encourage teachers to attend conferences, workshops and university courses related to Mathematics teaching and learning, reward teachers who participate in relevant professional development; and examine issues and concerns related to technology such as student access to calculators (Cauley et al., 2003:12).

Principals are also encouraged not only to facilitate collegial coaching among Mathematics teachers, but also to "facilitate communication between Mathematics and other teachers so that students can learn true problem solving and reasoning in all areas" (Cauley, Van de Walle, & Hoyt, 2003:28). They also saw the need for administrators to consider restructuring the school day as a way to give students adequate time to engage in inquiry and problem-solving. With longer class periods or shared study halls, the authors claimed that teachers would have time to participate in activities such as: observing one another, working to revise curricula, and developing new methods of assessment. According to Cauley and Seafarth, principals should also provide resources to enable teacher to acquire instructional materials such as computers, software, graphing calculators and manipulatives. All these activities will go a long way in promoting the teachers and learners' attitudes towards Mathematics.

2.5.3 Giving learners sufficient opportunity to learn Mathematics

The extent of the student's opportunity to learn Mathematics content (exposure) bears directly and decisively on student Mathematics achievement and attitudes (Grous & Cebulla, 2000:01). Opportunity to learn was studied by Second International Mathematics Study (TIMSS) (Schmidt, McKnight & Raizen, and 2007:26). The study revealed a strong correlation between the opportunity to learn scores and mean student achievement scores, with high opportunity to learn scores associated with high achievement and positive attitude towards Mathematics. The study revealed that it is very prudent to allocate sufficient time for Mathematics at every grade level. Short class periods of about 30-35 minutes in Mathematics, instituted for whatever practical or philosophical reason, should not be allowed

(Schmidt, McKnight & Raizen, 2007:26). This implies that in order to perform excellently in Mathematics learners should spend more time on their learning activities. Additional time must be arranged to assist learners, for example, afternoon, morning and Saturday studies.

Teaching and learning should also take place during school holidays. The Mathematics department of a school should also design several interventions to assist learners who are struggling with Mathematics. They should provide summer workshops to students free of charge, provide tutoring periods during activity periods, and meet with students regularly before school, after school and on Saturdays. Teachers should also begin a new class which requires struggling learners to have 90 minutes of Mathematics instruction every day.

2.5.4 Promoting positive attitudes through co-operative learning

Cooperative learning also creates positive attitudes of learners towards Mathematics. Research indicates that learner's attitudes toward Mathematics have also been shown to change in a positive manner when exposed to cooperative learning. Walmsley and Muniz (2003:113) conducted a study of two geometry classes to compare grades and attitudes of students in cooperative learning groups (experimental group) versus students in a lecture course (control group). After nine weeks, they compared the grades and found that the students who were taught using cooperative learning had increased their grades more than the control group. They concluded, through post surveys, that the experimental group had gained a more positive attitude toward Mathematics. The students enjoyed working with each other and also felt cooperative learning could help them understand and learn Mathematical ideas.

In a cooperative learning environment, learners work together on a given task while still being held accountable on an individual basis. Individualistic learning situations and competitive situations create negative interdependence because they rely on only one person succeeding and that success is independent of the class' performance. Cooperative learning gives learners a common goal where the group will be rewards for its efforts (Johnson & Johnson, 1988).

Cooperative learning helps learners learn how to work with each other, build up confidence and positive attitudes in their fellow peers, and learn from each other (NRC, 2001; Walmsley & Muniz, 2003:113). Cooperative learning does not stress individual achievements or create a competitive classroom.

2.6 CONCLUSION

There are various factors that are responsible for poor achievement in Mathematics. Most of these factors are influenced by negative attitudes. Attitudes cross many different aspects of everyday life. In businesses, motivational speakers are invited and team building exercises are conducted to help inspire employees to have a more positive attitude towards their work in order to increase productivity. In sports coaches spend a significant amount of practice time talking to their players about “believing in success” and reminding players that any team can beat any other team on any given day. Changing people’s attitudes is well known and accepted in today’s society. This philosophy is no different in classrooms than it is anywhere else in society. McCleod (2002) said that attitude toward Mathematics is related to Mathematics success in the classroom. It is therefore important for teachers to improve student work to make a positive change in their attitude toward Mathematics.

This chapter provided the overview of learner performance, the factors which contribute to poor academic performance and the views of experts on effective school improvement strategies. Research methodology and design of the study will be presented in the subsequent chapter.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

Chapter 2 provided a review of the literature that expounds on the influence of learners' attitudes on primary school Mathematics learning as researched within South Africa and internationally. The literature review focused on learning how other scholars have said, theorized and conceptualised issues related to learners' attitudes towards Mathematics. This study is aimed at systematic collection and interpretation of information, which will enable the researcher to suggest solutions for the declining performance in Mathematics in most schools in the Mopani District of the Limpopo Province. The current crisis is putting pressure on educators and school managers to improve their practice by adopting more creative ways of teaching and managing schools for the purpose of improvement of learner performance in the schools.

The aim of this chapter is to provide an explication or detail of the research design and methodology used to conduct this research. This includes a description on the research paradigm, research questions, research design, sampling, the data collection methods and the methods for data analysis. The researcher hopes that this study will provide valuable input to the improvement of attitudes of learners towards Mathematics in the primary schools in the area under study.

3.2 PHILOSOPHICAL FOUNDATIONS

Research is guided by a set of beliefs about the world and how it should be understood and studied in order to guide action (Denzin & Lincoln, 2003:11). The set of beliefs about the world and how it should be understood and studied is called a "paradigm" (Guba, 1990:17). According to Hursey and Hursey (1997:47), a research paradigm refers to the progress of scientific practice based on people's philosophies and assumptions about the world and the nature of knowledge. Paradigms are described by Thomas (2009:72) "as shared ideas in a particular community of inquiry, the thinking habits of researchers and the rules of procedure for research".

A paradigm influences the researcher's decision in terms of research questions and methodology (Morgan, 2007:49). All research should be based on a paradigm that clarifies the study and researchers must consider the interaction of such views when conducting research (Creswell & Piano Clark, 2007:21). The philosophical or epistemological paradigm informs us how research should be conducted.

Objectivism-positivism and constructivism are the two main paradigms utilized in educational research (Arminio & HutIgren, 2002:19). The objectivist-positivist paradigm considers reality as definable and quantifiable and therefore examines it from the distant and objective perspective. The goals of objectivist-positivist research are to control and make predictions (Broido & Manning, 2002:18). Quantitative research is generally based on this paradigm. In contrast, constructivism is associated with subjectivity and it accepts the possibility of multiple realities (Denzin & Lincoln, 2003:112). The purpose of constructivist research is making meaning by engaging the world, rather than verification of measurable, objective and factual data and qualitative research is based on this paradigm. According to Armino and Hutigren (2002:128), meaning is co-created by means of a partnership between the researcher and the participants, during the research process.

It is however possible for researchers to utilize more than one paradigm in one study. The use of more than one paradigm in a single study is called "interbreeding" of the paradigms (Guba & Lincoln in Denzin & Lincoln, 2003:254). This study will be based on constructivism paradigm because the aim of the study is to predict the success of, and explore the meanings attached to, learners' attitudes towards Mathematics learning.

3.3 RESEARCH QUESTIONS

Against the background of the problem described in Chapter 1, the following are the research questions for this study:

- What are the factors which influence the attitude of learners towards Mathematics in primary schools located in the Groot Letaba Circuit in Limpopo Province?
- What is the relationship between learners' attitudes in Mathematics and achievement in this subject?
- What is the role of gender on the attitude of learners towards Mathematics?
- What are the factors which contribute to the low participation of learners in Mathematics in Groot Letaba Circuit schools?

3.4 AIM OF THE STUDY

The aim of this study is to investigate the primary school learners' attitudes towards learning Mathematics in primary schools in the Groot Letaba Circuit in Limpopo Province.

3.5 OBJECTIVES OF THE STUDY

The following objectives will assist in achieving the main aim of this study:

(d) To investigate if there are any relationships between learners' attitudes in Mathematics and achievement in this subject.
(e) To investigate if the negative attitudes of learners towards Mathematics are gender related.
(f) To identify the factors that contributes to the low participation of learners in Mathematics in Groot Letaba Circuit schools.

3.6 RESEARCH DESIGN

In defining what is meant by the research, Cohen and Manion (1994:29) describe research as the process of arriving at dependable solutions to problems through planned and systematic collection, analysis and interpretation of data. It is regarded as a family of methodologies each of which leads to statements of knowledge. Mouton (2002:107) defines research design as a set of guidelines and instructions that must be followed in addressing the research problem while De Vos et. al (2002: 271) defines research design as the entire process of research from conceptualizing a problem to writing a narrative. It indicates who or what is involved, and where and when the study will take place (Du Plooy, 2001:81). The function of the research design is therefore to enable the researcher to anticipate what the approximate research decisions should be so as to maximize the validity of the eventual results (Mouton, 2002: 107).

A case study design will be used in this study to explore learner attitudes and beliefs towards Mathematics in two selected schools in the Groot Letaba Circuit of the Limpopo Province.
A case study is defined by Babbie (2007:298) as the in-depth collection, examination and presentation of detailed information of some social phenomenon, such as a particular participant, a village, school, family or a juvenile gang. By looking at a range of similar and contrasting cases, a researcher can understand a single-case finding, grounding it by specifying how, where and why it carries on as it does (Miles & Huberman, 2004:29).

A case study design is preferred in this study because the researcher believes that it will be capable of yielding new insights and illuminating meanings into the problem under investigation. The researcher also believes that a case study is the best design for breaking new ground for a better understanding of the factors which contribute to the negative attitude of learners towards Mathematics. The case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon that can result in a rich and holistic account of a phenomenon (Merriam, 2008:89).

Another advantage of a case study is that it is narrower in scope but more exhaustive and more qualitative in nature than a survey (Tuckman, 2003:295). A research design determines the research methods to be used in a study.

3.7 RESEARCH METHODOLOGY

The research methodology refers to a system of methods used in a particular field to reach a valid and reliable perception of phenomena, events, processes or issues at many different levels (Soanes, 2002:565). It also refers to the application of a variety of standardized methods and techniques in the pursuit of valid knowledge (Mouton, 2002:35). The research methodology is determined by the research approach followed in the study. Two main types of approaches are used in research, namely, qualitative and quantitative approaches.

3.7.1 Qualitative approach

According to Denzin and Lincoln (2003:10), the word qualitative implies an emphasis on the qualities of entities and processes and on meanings that are not experimentally examined or measured (if measured at all) in terms of quantity, amount, intensity or frequency. Qualitative researchers stress the socially constructed nature of reality, the intimate relationships between the researcher and what is studied, and the situational constraints that shape inquiry (Denzin and Lincoln, 2003:10). According to (Babbie, 2004:26) the distinction between quantitative and qualitative data in social research is the distinction between numerical and non-numerical data; for instance, when you say someone is ugly, you have made a qualitative assertion. When you say he or she is “a size 9”, you are attempting to quantify your qualitative assessment. Streubert Speziale and Carpenter (2003:15-17) identify the following principles of qualitative approach:

- Believing in multiple realities.
- A commitment to identifying an approach to understanding that supports the phenomenon under study.
- Being committed to the participants’ viewpoints.
- Conducting the research in a way that limits disruption of the natural context of the phenomenon under study,

- Acknowledgement of the participants in the research process, and
- Reporting data in a literary style rich with participants' commentaries.

Brynard & Hanekom (2005:02) add that qualitative research produces descriptive data – generally people's own written or spoken words. In qualitative approach, literature and theory are used to understand what is going on in the field and to discover theoretical perspectives and concepts and data collection takes place by means of interviews and observation (Hodkinson, 2000:13).

3.7.2 Quantitative Approach

The Quantitative approach on the other hand is a formal, objective, systematic process in which numerical data are used to obtain information about the phenomenon under investigation (Van Rensburg, 2010:85). Creswell (2003:18) concurs when he asserts that a quantitative approach is one in which the researcher primarily uses post positivist claims for developing knowledge and collects data on predetermined instruments that yield statistical data. Creswell (2003:02) adds that , quantitative methods are used chiefly to test or verify theories or explanations, identify variables to study, relate variables in questions or hypotheses, use statistical standards of validity and reliability, and employ statistical procedures for analysis.Quantitative approach makes our observations more explicit, makes easier to aggregate, compare and summarize data nd it opens up the use of statistical analyses ranging from simple averages to complex formulaes and mathematical models (Babbie, 2004: 27).

Table 3.1 illustrates the differences between the qualitative and the quantitative approaches:

Steps in the research process	**The elements of qualitative approach**	**The elements of quantitative approach**
Intention of the research	• an understanding of the meaning individuals give to a phenomenon inductively	• to test a theory inductively to verify or disprove it
How literature is used	• a minor role • justification of the problem • validation of findings	• major role • justification of the problem • to identify questions and hypotheses
How the intention is focused	• ask open-ended questions to understand the intricacy of a single phenomenon	• ask closed-ended questions • to test specific variables that develop hypotheses or questions
How the data are collected	• words and images from a small sample group at a few sites • to study participants in their personal surrounding	• numbers • from a large sample group at many research sites • sending or administering instruments to participants
How data are analysed	• analysis of text or images • coded into larger themes	• analysing numerical statistics • rejecting hypotheses or determining effect sizes
Role of the researcher	• is the research instrument • recognizes personal opinion • reporting bias	• remains in the background • takes necessary steps to remove bias
How data are validated	• validity measures that depend on the participants, the researcher or the reader are used • literature	• using validity procedures based on external standards such as statistics, judges, past research

Table 3.1 Elements of quantitative and qualitative research in the research procedure (Adapted from: Creswell and Plano Clark (2007:29).

Certainly, both qualitative and quantitative research approaches have individual strengths and weaknesses and evaluating the strengths and weaknesses of each approach involves a form of qualitative research in itself (Gerhardt, 2004:13). In the achievement of the aims of this study, the researcher decided to use a qualitative study which will be used as the basis of the investigation.

The qualitative approach will allow me to explore the views of the learners about their attitudes towards learning Mathematics. In this study, I am interested in the meanings of the narratives of the participants and the qualitative approach will enable me to remain committed to the viewpoints of the participants because I want to understand what is influencing them or not influencing them to adopt a particular attitude towards learning Mathematics. The qualitative approach will also enable me to use multiple methods of data collection, such as interviews and observation in order to acquire an in-depth understanding of their attitudes towards learning Mathematics. Lastly, as a naturalistic approach, the qualitative approach will enable me to limit the disruption of the natural context of learners' attitudes towards Mathematics.

3.7.3 Population, Sample and Subjects

3.7.3.1 Population

A population of a study is the entire group of persons or set of objects and events the researcher is interested in gaining information and drawing conclusions about (Van Rensburg, 2010:150, Bless and Higson-Smith, 2000:84). A population is sometimes referred to as "target population" or universe (Bless &Higson-Smith 2010:84; Brink, Van der Walt & Van Rensburg 2006:123; De Vos, Strydom, Fouche & Delport 2005:338). Due to the research design of this study, namely; case study design, two primary schools (10.5%) will be selected purposefully from 19 primary schools in the Groot Letaba Circuit. The population of this study will be all learners from the two selected primary schools. The following table illustrates the population of this study:

School	Learners
Primary School A	455
Primary School B	520
Total	975

Table 3 Population of the study

3.7.3.2 Sampling

Sampling is the process of selecting units, for example, people, organizations, from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen (McMillan & Schumacher, 2010:129, Terblanche & Durrheim, 2010:274, Cresswell, 2009:56). De Vos et. al. (2002:198) concur when they define sampling as taking any portion of a population as a representative of that population. Du Plooy (2002: 100) defines it as following a rigorous procedure when selecting units of analysis from a larger population. An element or set of elements considered for selection in some stage of sampling is called a sample (Babbie, 2007:190). A sample is therefore a group of people or units you select to be in your study.

There are two methods of sampling, namely; probability sampling and non-probability sampling (Babbie, 2004:182). Probability sampling method is any method of sampling that utilizes some form of random selection from a list containing the names of everyone in the population being sampled (Babbie, 2004:182). Examples of probability sampling are systematic random sampling, simple random sampling, cluster random sampling, and multi-stage sampling and stratified sampling (Babbie, 2004: 201-212). Non-probability sampling does not involve random selection. Examples of non-probability sampling are convenience sampling, snowball sampling and purposive sampling (Schultze, 2002:35). In this study a sample will be chosen by purposive or judgement sampling. In purposive sampling researchers handpick or selects the cases to be included in the sample on the basis of their judgement of their typicality and in this way build up a sample that is satisfactory to their specific needs (Cohen, Manion and Morrison, 2000:103).

In this study, sampling of learners will be carried out by selecting two learners in each class using purposeful sampling. The following table illustrates the sample of learners in all classes:

Grade	School A	School B	Total
1	2	2	4
2	2	2	4
3	2	2	4
4	2	2	4
5	2	2	4
6	2	2	4
7	2	2	4
Total	7	7	28

Table 4 Sample of learners

The table above indicates that 28 learners will be selected as the sample of the study using purposive sampling technique in which the researcher selects particular elements from the population that will be representative or informative about the topic of interest (Cohen et al., 2010:103; Creswell, 2003). The two schools have the total enrolment of 455 and 520 respectively.

3.7.3.3 Data gathering

Data collection refers to the collection of information to be used in the investigation. In this investigation an interview and observation methods will be used to collect the data.

(i) The interview

Brynard and Hanekom (2005:32) define interviewing as a method of collecting data that allows the researcher to ask an interviewee questions. I prefer this instrument in this study because

- it will provide me with more information in greater depth,
- I will be able to establish relationships with the respondents,
- it will offer me an opportunity to overcome any resistance and also to restructure questions if necessary,
- I will be able to record their answers and respondents do not have to be literate.

There are two main types of interviews, namely; structured and unstructured interviews (Cohen, Manion and Morrison. 2002:270). In structured interviews, questions and the order in which they are asked are determined in advance. In unstructured interview, the interviewer does not follow any structure at ll, but covers as much ground on a given topic with the respondent (Cohen, Manion and Morrison. 2002: 271). A structured interview will be used in this study because it will make the process of tabulating, coding, transcribing and analyzing the responses easier and less time will be needed for the administration of the interview as a whole. A **closed-ended or structured interview** will be used to explore the following:

(a) **Attitudes**: The main factors which contribute to the negative attitude of learners towards Mathematics in primary schools in the Groot Letaba Circuit in Limpopo Province.

(b) **Relationships**: The relationships between learners' attitudes in Mathematics and achievement in this subject.

(c) **Gender**: Whether the negative attitudes of learners towards Mathematics are gender related?

(d) **Participation**: The factors which contribute to the low participation of learners in Mathematics in Groot Letaba Circuit schools.

(e) **Strategy**: An effective strategy that will enhance the love of Mathematics in Groot Letaba Circuit schools.

The interview will be complimented by observation method of data collection.

(ii) Field observation

An observation is a data collection instrument in which researchers collect data on the current status of entities by watching them and listening to them rather than asking questions about them (Smit, 2003:94).Observation is preferred in this study because:

- It will assist me in understanding the context because the information relates to what is currently happening,
- It will eliminate my subjective bias and this method is independent of respondent's willingness to respond.

Observation involves getting close to the people and making them feel comfortable enough with your presence so that you can observe and record information about their lives (Bernard, 2006:342). An observation is preferred in this study because it will assist me in understanding what occurs in real life as opposed to in highly contrived or artificial settings (Bernard, 2006:343). Learners' behaviour in the classroom will be recorded as it occurs naturally. Another advantage of observation is that when I use observation there won't be any need to worry about self-report bias, social desirability and response set and the information is not limited to what can be recalled accurately by the subjects (Bernard, 2006: 343). Observation is also independent of respondent's willingness to respond. In this study I will adopt the non-participant observer role because I don't want to be engaged in activities that distracts me from data collection. I will observe the learners for one day in their classrooms during Mathematics periods. learning and discussions. Since the focus of this study are the attitudes of learners towards learning Mathematics, my observation will focus on the following variables:

(a) **Affective attititudes**: This is basically the evaluative element in an attitude such as feelings and emotions, which the attitude holder judges. Since attitudes are accompanied by positive or negative feelings, I will observe how they naturally express their feelings and emotions while learning Mathematics.

(b) **Behavioural attitudes**: This refers to the behavioural aspect of attitudes. It involves a person's intentions to act in a certain way towards an event and these intentions are related to the affective component (Wetherell (1996) in Mathonsi, 2006:12). This suggests that one who has some emotional reaction to Mathematics might be assumed to act on this basis. I will therefore observe their behaviour during Mathematics learning.

(c) **Cognitive attitudes: A**ttitudes also have a cognitive component. This incorporates knowledge and beliefs about the process (Gagne (1985) in Mathonsi, 2006:12). An individual will have a positive attitude towards an aspect he fully understands and knows. In this regard I will observe whether they understand what they are learning during the period of Mathematics.

In this study I will adopt the non-participant observer role in which I will interact with the respondents without taking a role as a group member but the respondents will be aware of my presence as a researcher. I will observe the teaching of Mathematics in the classes.

3.7.4 Data analysis

In every study the data collected need to be analysed before they can be interpreted. According to Babbie (2007:378) and Corbin and Strauss(2008:01) data analysis refers to a process of examining and interpreting data in order to elicit meaning, gain understanding and develop empirical knowledge. The following procedures as proposed by Tesch (in Cresswell, 2009:186) will be used to analyse the data collected by the interviews and observation.

Steps	Activity
1	The information collected is firstly organized. Once I have organized and prepared the data, I will read through all the transcriptions carefully and make notes.
2	I will read through all the transcripts of the interview. I will then consider the content or underlying meaning of the information and write down my thoughts on the margins.
3	I will then make a list of all the topics, put similar topics together and form these topics into columns that might be grouped as major topics, unique topics and leftovers.
4	I will take the list of topics and assign to each topic an abbreviated and identifiable code. I will then take the list of topics with abbreviated codes and go back to the transcribed data and write the codes next to the data segments that correspond with the code.
5	I will write the most descriptive wording for my topics and turn them into themes or categories.
6	I will make a final decision on the abbreviation for each theme or category and alphabetise these codes.
7	I will assemble the data material belonging to each theme or category in one place and do a preliminary analysis.
8	I will finally start interpreting and reporting the research findings.

I will always guard against any bias and subjectivity with my findings in order to ensure the trustworthiness and authenticity of research findings. In this study, I will avoid my bias and subjectivity in the framing of questions by not giving my personal opinion.

3.7.5 Research validity and reliability

In this study, the validity of my investigation will be ensured by reviewing the relevant literature on the problem in order to establish their findings; using a heterogeneous sample (male and female and younger and older respondents);

assuring the respondents that their identities will not be revealed; and ensuring that the instruments that I use to collect the data are valid.

According to Bostwick and Kyte (in De Vos 2002:166) a valid measuring instrument is the one which measures what it is supposed to measure, and yields scores whose differences reflect the true differences of the variable or concept being measured rather than random or constant errors. In this respect I will discuss the research problem with the respondents before administering the instrument.

I will also ensure the reliability of the investigation. The term reliability means that measurements made are consistent and if the same experiment is performed under the same conditions, the same measurements will be obtained (De Vos et.al.2005:41). In this study, reliability will be achieved by subjecting the instruments to a pilot study. The aim of the pilot study is to determine possible flaws in terms of ambiguity and the possibility of repetition of questions. At the end of the pilot study, I will determine if there is a need to refine some research questions.

3.8 LIMITATIONS OF THE STUDY

When this study was designed, the researcher became aware of several limitations in the design of the study. The following were identified as limitations of the study:

- This study was demarcated to one District of Limpopo Department of Education, namely; Mopani District, while there are presently five districts. It is the view of the researcher that this delimitation has to a certain extent decreased the generalizability of the research findings. This study could have been extended to the other districts.
- Demarcating the research area to one circuit only, further decreased the generalizability of the research findings. This study was demarcated to one circuit of the Mopani District of the Limpopo Province, namely the Groot Letaba Circuit. The Mopani District consists of 24 circuits. It would have been ideal if the study were extended to more circuits.

- The study is limited to a sample from two schools only. A sample from two schools only may not be fully representative of the perceptions of all educators, parents and learners in the Limpopo Province.

Notwithstanding these limitations, the researcher believes that the findings of this study will contribute to enhancing the attitudes of learners towards learning of Mathematics.

3.9 CONLUSION

In this chapter the researcher discussed the research design for the study. The instruments used in the study, pilot study, sample design and size and data collection procedures were discussed. Data analysis and interpretation will be presented in the subsequent chapter

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. INTRODUCTION

In Chapter 03, a description of the research paradigm, research questions, research design, sampling, the data collection methods and the methods for data analysis were discussed. The purpose of this chapter is to present or report, analyse and interpret the results of the investigations carried out and thus provide answers to the research questions that guided this study. The chapter presents the results of the data analyses carried out to address the research questions. This study is aimed at systematic collection and interpretation of information, which will enable the researcher to suggest solutions for the declining performance in Mathematics in most schools in the Mopani District of the Limpopo Province. Data was collected from grade 1, 3, 5, 6 and 7 Mathematics teachers and also from their learners. Data was collected from both the teachers and learners using an interview. A total of 5 teachers and 24 learners took part in the study.

4.2 DATA PRESENTATION: EDUCATORS

4.2.1 Factors that might contribute to the negative attitude of learners towards Mathematics in the primary schools.

Participants	Theme 1: Assumptions	Theme 2: Repeated failure in Mathematics	Theme 3: Lack of resources	Theme 4: Medium of instruction	Theme 5: Quality of teaching
Educator no. 1	Many learners believe that Mathematics is complicated.	Many learners don't pass Mathematics tests.	There is a shortage of textbooks in many schools.	Learning Mathematics in a foreign language is a problem.	Shortage of qualified teachers in Mathematics.

Educator no. 2	Family members discourage learners.	Many learners perform poorly in Mathematics home works.	Many schools do not have Mathematical tools and equipment, such as Mathematical instruments, scientific calculators to assist in the teaching of Mathematics.	Most learners do not understand English Mathematical concepts.	Mathematics teachers leave teaching because of many opportunities.
Educator no. 3	Many learners believe that Mathematics is for geniuses.	Very few learners pass Mathematics at the end of the year.	Due to poverty in many families many parents are not able to buy Mathematical equipment and tools for their children.	Many learners are not proficient in English.	Primary school teachers teaching in high schools.
Educators no. 4	Some teachers tell learners that Mathematics is difficult.	Many learners in the primary school repeat because of failing Mathematics.	Schools are not capable of retrieving Mathematical equipment and tools borrowed to the learners.	Mathematics is not taught in mother-tongue.	Lazy Mathematics teachers discourage learners.
Educator no.5	Many learners dislike Mathematics educators.	Very few learners pass the trial and half-yearly examinations.	Many schools have insufficient classes which result in overcrowding which also complicates effective teaching of Mathematics.	Many learners do not understand English Mathematics textbooks.	Mathematics teachers with negative attitude towards Mathematics pass it over to learners.

The findings of the study reveal that there are three main factors which contribute to negative attitudes of learners towards learning Mathematics, namely, the language of instruction, repeated failing of mathematics and quality of teaching. One of the respondent remarked as follows about the influence of medium of instruction:

I believe that learning Mathematics through English language contributes to the negative attitude of learners towards Mathematics. I strongly advocate the need for a shift from an English to a mother-tongue based educational system. If the language of teaching at school is the same as the language of the home, there is a very natural continuity between the home and the school, and in some ways, the good teacher can genuinely take the place of the parent. What I have noticed is that learners who did not learn in a language they were familiar with participates minimally in classroom discussions,

Perform below par in relation to other students, experience feelings of inferiority and low self-esteem and experience higher rates of failure and repetition, and are more prone to dropping out from school.

According to the respondents, the problems associated with language needs to be acknowledged and addressed. The respondents also indicate that the rapid change of the language of teaching and learning (LOLT) is abrupt without learners having acquired sufficient competence in English. As a result, there are many learners who, after many years of schooling, are not able to write even simple sentences, or to do basic arithmetic and fewer able to follow their lessons in English which is more often than not taught by a teacher who too lacks this competence (Department of Education, 2011).

4.2.2 The consequences of negative attitudes towards Mathematics.

Participants	Theme 1: Negative attitude	Theme 2: Poor performance	Theme 3: Disruptive behaviour
Educator no. 1	Learners always absent from class	Many learners don't pass Mathematics tests.	Some learners lock the door to prevent Mathematics educator into the classes.
Educator no. 2	Learners don't participate actively in class; they are passive.	Many learners perform poorly in home works.	Most learners make noise during the lesson presentation.
Educator no. 3	Many learners don't write tasks given.	Very few learners pass Mathematics at the end of the year.	Some learners go out of the class during the lesson presentation.
Educators no. 4	Many learners don't come with Mathematics books and equipment to school.	Many learners in the primary school repeat because of failing Mathematics.	Some learners fight during the lesson presentation.
Educator no.5	Many learners dislike Mathematics educators.	Very few learners pass the trial and half-yearly examinations.	Some learners destroy Mathematics books and equipment of other learners.

The findings of the study revealed that learners at this school do not enjoy learning Mathematics. All the participants are Mathematics teachers and they indicated that learners at the school are always absent from Mathematics classes and they don't participate actively in class. One of the participants remarked as follows:

We have a problem with learning Mathematics at our school. My learners don't enjoy learning Mathematics. Many of my learners are not active during the Mathematics period. Some of them sleep while I am teaching. Others refuse to participate in discussions and don't write Mathematics tasks given to the class.

4.2.3 Difference between male and female learners with regard to their attitudes to learning Mathematics.

Participants	Theme 1: Assumptions of sex role	Theme 2: Cultural influence
Educator no. 1	General belief in communities that Mathematics is a male domain.	In African cultures and other cultures females are not supposed to work.
Educator no. 2	General belief in communities that the intelligence of females is inferior to that of males.	Culturally the place of a female in Africa is in the kitchen which requires no knowledge of Mathematics.
Educator no. 3	Community belief that Mathematics is not for the weaker sex (females) but for the stronger sex (males).	According to African culture women should not go to school.
Educators no. 4	General belief in communities that girls should do subjects related to caring, cooking and catering.	Culturally women are soft and tender and therefore needs soft subjects.
Educator no.5	General belief in the communities that females lack confidence.	Mathematics requires learners to constantly ask questions from the teachers and also engage in discourses with teachers. This is against African culture of not questioning older people.

The findings of the study reveal that the assumptions of sex role and cultural influences contribute to the additional negative attitudes of female learners towards learning Mathematics. One of the respondents emphasized it as follows:

I have very few girls in my class. I did an investigation to find out why many girls don't want to learn Mathematics. I discovered that their hatred is related to their traditional values.

They believe that Mathematics is for people who do hard work; namely; men. They erroneously indicate that their careers won't involve Mathematics.

4.2.4 The factors that contribute to the low participation of learners in Mathematics in your school?

Participants	Theme 1: Low academic achievement	Theme 2: Negative attitude
Educator no. 1	Learners get low grades in Mathematics tests.	Girls believe that it is a masculine subject.
Educator no. 2	Learners are not able to do Mathematics home works and class works correctly.	Some learners hate learning.
Educator no. 3	Learners have never passed any Mathematics test in high school.	Pressure from parents and teachers to perform well and uninteresting tasks.
Educators no. 4	Learners get little or no motivation from parents, peers, siblings and community members in learning Mathematics.	Fewer women are employed in jobs requiring mathematical ability.
Educator no.5	Learners are taught by poorly qualified Mathematics teachers.	Teachers are not committed to their work.

The study revealed that there are many factors which contribute to the negative attitude of learners towards Mathematics. The respondents indicate that learners experience with mathematics contributes to the negative attitudes of many learners towards Mathematics. One of the respondents said:

I have noticed that learners in the primary school are not negative towards Mathematics. As the learners progress to higher grades they develop negative attitudes because of the constant failure of failing Mathematics tasks, tests and examination.

I truly believe that any person, including myself, who fails a subjects many times will develop a negative attitude towards that subject. I believe it is not the fault of the learners but the education system itself

4.2.5 The strategies that can be used to motivate learners to learn and performs well in Mathematics.

Participants	Theme 1: Motivation	Theme 2: Staffing	Theme 3: Teaching methods
Educator no. 1	Subject specialists should be invited to motivate learners	Mathematics teachers must be recruited from other countries.	Educators must use constructivist methods of teaching.
Educator no. 2	Principals and heads of department must motivate the learners.	Only appropriately qualified Mathematics teachers should teach Mathematics	Educators must not use lecture methods but allow learners to be active.
Educator no. 3	Involvement of parents and other stakeholders to motivate learners.	Only educators who specialised in Mathematics should teach Mathematics.	Educators should use a lot of technology when teaching Mathematics.
Educators no. 4	Educators should stop telling learners that Mathematics is difficult	Mathematics educators should be supplied to schools by the department.	They need orientation about Mathematics.
Educator no.5	They need educator whom will love them.	Only educators who specialised in primary school Mathematics should teach the learners.	Educators must apply different methods of teaching that will cater for the learners' individual needs. needs

The interviewees recommended various strategies for motivating learners to perform well in Mathematics, such as constructivist teaching strategies, giving homework every day, teaching methods that will cater for learners' individual needs,

allowing only educators who specialised in primary school Mathematics to teach Mathematics and inviting Mathematics specialists to come and motivate the learners. The interviewees were very emphatic about the use of teaching methods which will change the attitudes of learners. One of the interviewees said:

I believe that we can change the attitudes of learners and their poor performance by using modern technology such as computers. Computers can be used in teaching Mathematics in a number of ways such as the tutorials, hypermedia, simulations and educational games. Demonstration, testing, information, and communication are the main facilities provided by computer assisted instruction.

The views of the educators are supported by many specialists and researchers. For example, according to Kilpatrick and Davis (1993), in order to achieve such changes, teachers should move away from traditional teacher-centred classroom practices, such as lectures and drill and practice activities, into a more student-centred context that allows students to work collaboratively and cooperatively to develop learning skills. Picciano (2004) indicates that the increased use of technology, especially computer technology, in educational processes has been incorporated as a way to improve educational opportunities, while enhancing student performance.

4.3 DATA PRESENTATION: LEARNERS

4.3.1 The benefits of learning Mathematics in primary school.

The findings of this study reveal that learners are aware of the benefits of Mathematics. The majority of the learners indicate that by learning Mathematics they will be able to count, read symbols, know change when they buy during breaks and read. One of the learners replied as follows:

Mathematics is very good for me because it helps me to count my money and the change which I get when I buy cold drink during break. I also like Mathematics because I am able use a tape.

It is very interesting that the learners do not refer to how Mathematics will assist them in their future career but it is reasonable at their age.

4.3.2 The necessity of declaring Mathematics a compulsory subject.

The findings of the study reveal that learners are against declaring Mathematics a compulsory subject. The learners indicate that the government was very unreasonable and harsh by declaring Mathematics a compulsory subject. The reasons they advance is that it is unreasonable to make a difficult subject compulsory. They indicate that the government must first ask every student if he or she interested in learning Mathematics instead of making it compulsory. One of the learners replied as follows:

I am very angry that the government makes Mathematics compulsory for everyone. It is against our rights. We must choose the subjects with our parents and not the government. I think that the government wants to destroy our future because we shall not pass Mathematics because it is very difficult. My parents told me that they never did Mathematics when they were students but we are forced to learn mathematics. It is unfair.

4.3.3 How learners enjoy learning Mathematics.

According to the findings of the study, many learners in Grades 1 to 3 enjoy learning Mathematics, while learners in Grades 4 to 7 do not enjoy learning Mathematics. The learners also indicate that they do not enjoy learning Mathematics because Mathematics is a very difficult subject. Two learners indicated that they don't enjoy Mathematics because Mathematics teachers are not friendly to them. The main reason for this appears to be that Mathematics becomes more difficult as they progress to higher classes. One of the Grade 4 learners interviewed answered as follows:

When I was in Grade 2, I used to love and enjoy learning Mathematics but now I don't enjoy it because it is very difficult. I don't like it because of our Mathematics teacher. He is too strict and always punishes us when we make mistakes. I am not happier when I learn Mathematics.

The learner indicates that he used to love Mathematics in the elementary classes, but he is no longer interested in the subject, is supported by several studies. A study conducted by Mcleod (1994) revealed that that attitudes tend to become more negative as pupils move from elementary to secondary school. This view is supported by a Grade 1 learner who responded as follows:

My teacher, I like and enjoy Mathematics because it teaches me to count my pocket money. We learn Mathematics every day in the morning and I enjoy the subject more than any other subject. My teacher makes me to love Mathematics because she gives us things to count and she is not fast. I enjoy it.

Cheung (1998) wrote about the attitude toward Mathematics and the ages of 11-13 year olds. He states that these ages are particularly important in the development of a Mathematical attitude. This is the time when negative attitudes become most noticeable. Cheung (1998) asserts that the possible reasons behind this are the greater prevalence of abstractions in Mathematics material. In his research, using a Pearson correlation, he found a positive correlation between attitude and Mathematics achievement. The correlation showed that the more positive the attitude, the higher the level of achievement was in the student.

4.3.4 How learners enjoy learning other subjects.

Mathematics is one of the subjects done by learners in the primary school. It is therefore important to investigate the performance and attitude of learners in the other subjects. This will assist us in understanding his attitude in learning in general. The findings of this study reveal that the majority of the learners enjoy learning in general, as one of the Grade 6 learners said:

I enjoy learning the other subjects because we learn while we talk, sing and playing. In other subjects we sit in groups and discuss and laugh while in Mathematics there is no discussion. It is the only serious subject where you sit alone and think. In English we tell stories and jokes while we learn. My best subject is Life orientation because we learn about our lives.

We discuss about things that we see and know and I enjoy it very much, unlike in mathematics where just learn numbers. I think Mathematics is a boring subject because I enjoy all subjects except Mathematics.

The response of the above learner indicates that there are many factors that contribute to his negative attitude towards Mathematics. One of the factors is the teaching methods adopted by the teacher. The learner indicates that there is no discussion and activities in Mathematics and this implies that the teacher is using the lecture method only. According to (Costello, 1991) lecture method is ineffective in that it turns the learners into passive participants in the learning process. Discussions, project and discovery methods creates an enabling environment for the learners and ensures that individual differences are taken care of. Some of these factors that influence attitudes are teaching materials used by teacher, teachers' classroom management, teachers' content knowledge and personality, teaching topics with real life enriched examples, other student‟ s opinions about Mathematics courses (Yilmaz, Altun & Olkun, 2010), teaching methods, reinforcement (Papanastasiou, 2000), receiving private tuition (Köğce et al, 2009), teachers‟ beliefs towards Mathematics (Cater & Norwood, 1997) and teachers‟ attitude toward mathematics (Ford, 1994, Karp, 1991).

4.3.5 Do you pass Mathematics tests? If not why?

The findings of this study reveal that the majority of the learners do not pass Mathematics and their performance is very poor. Only two learners indicated that they do pass tests in Mathematics. When the learners are probed as to why they do not pass Mathematics tests, they identified several contributory factors. One of the learners interviewed, in reflecting her displeasure in learning Mathematics and a need to be helped said that

“My problem is that our Mathematics teacher is too fast. I do not understand and enjoy Mathematics and I want a teacher who is patient and does not get angry with me. *I don’t enjoy learning Mathematics because if I tell the teacher that I don't understand he ends up shouting and asking “how come you don't understand such an easy sum, you just don't use your brains".*

One of the two learners who pass mathematics tests responded as follows:

Yes I do pass Mathematics tests. I think I pass because of the assistance that I get from my mother at home who is a Mathematics teacher in another school. I can tell you, what I learn at home is better than what I learn at school. I find it easy to understand Mathematics at home because I am not afraid of asking questions to my mother. She explains very slowly and using our mother tongue to explain. I just find myself passing at school.

Another learner also was emotional when responding about tests and she said:

I am afraid of Mathematics tests. Mathematics is my greatest enemy. I do write Mathematics tests but I don't pass. I am not the only one who fail Mathematics test. In our class only one learner is able to pass Mathematics test. We are not worried because the teacher always tells us that Mathematics is a difficult subject and only geniuses pass it.

The responses of these learners about passing Mathematics tests indicate that there are several factors responsible for the learners' negative attitudes against Mathematics. The teachers' attitude is one of them, according to Aduda (2005), (Aduda, D. 2005). New report spells out the future of education. The Daily Nation Monday, April 2005 Nation Media Nairobi. http://www.kaeam.or.ke/e-journal/articles/vo). Teachers' attitude towards Mathematics teaching is one of the major contributors towards explaining the variance in students' cognitive achievement. The learners' responses indicates that there are teachers that teach Mathematics in a way that merely requires learners to listen, read and regurgitate and this depicts a negative attitude towards teaching. The learning of Mathematics depends on the way it is presented to the learner, the way the learner actively interacts with the learning experiences to him and the environment within which the learning takes place.

4.3.6 How learners judge the ability of their Mathematics teacher or how good is the teacher.

This study reveals that there are mixed feelings about their Mathematics teachers. One of the learners responded as follows:

I sometimes wonder why our Mathematics teacher was given Mathematics to teach us. She insists that we must memorize Mathematics formula because it is the only way to learn Mathematics. When I ask her a question, she becomes very angry and accuses me of laziness. She tells us that the new curriculum don't allow a teacher to spoon feed learners. She says that answers are in the textbooks and not in her.

Another learner interviewed indicates that their teacher usually struggles when solving Mathematical problems on the chalk board. In her own words she says:

Our teacher is having a problem in teaching Mathematics. She is struggling to solve Mathematical sums on the chalk board. She takes very long to complete a sum on the chalk board and sometimes she does not complete solving the problem. I don't think she is a good Mathematics teacher. She is also not kind to us. We are always punished for failing Mathematics meanwhile she is also struggling to teach us.
Surprisingly, there is one learner who protects their Mathematics teacher. The learner said:

Mathematics is a difficult subject for everyone. We struggle to learn Mathematics and our teacher also struggles when teaching us. It is not her fault because Mathematics is just a difficult subject. I don't blame her. Everywhere in South Africa, Mathematics is difficult. It is unfair to blame one person for the difficulty of Mathematics because there is no one who is good in Mathematics. Our teacher is good in treating us and she does not give us punishment and she doesn't give us much work to do because she is aware that mathematics is just a difficult subject for everyone.

4.3.7 Learners' views about learning Mathematics in English and not in the mother tongue.

English is the only medium of instruction for African learners in all schools. This is a major challenge facing African learners in all schools in South Africa. Many studies revealed that most Black learners in South Africa are disadvantaged by the medium of instruction. Many African learners are under-achievers in many subjects because they lack sufficient command of English, which is their second language. Most African learners struggle to communicate in English. Insufficient command of English leads to problems regarding effective comprehension of the content of academic material, analysis of questions and presentations of answers. In the examination or test, a learner may know the answer but fails to answer the question because of lack of adequate vocabulary. There are mixed feelings about learning Mathematics in English and not using vernacular as a medium of instruction. There are some learners who enjoy learning Mathematics in English because they are going to school to learn English and not their mother tongue. These learners think that it is a status to be able to communicate in English and this is supported by their parents. One of the respondents responded to the question of learning Mathematics in a foreign language as follows:

I like to learn Mathematics in English because I want to learn English. My parents say that I must learn good English because it is a sign of an educated person. My mother tongue is not used by many people in South Africa and everyone wants to learn English. I think it is good if I learn mathematics in English.

There are other learners who are against learning Mathematics in English. One of the interviewees who is a Grade 7 learner believes that learning in a foreign language like English; contribute to high failure rate in many schools. The interviewee said that:

African learners in South Africa are seriously disadvantaged by the medium of instruction, which is English. The first task of the learners is to master the English language, which is a serious challenge for the learner. The learners don't speak English in their homes, at school, when they play and even in social events.
They speak English in class only.

Many learners fail because they don't understand the language, and it is therefore difficult for these learners to acquire knowledge in a foreign language. During the examinations, they answer questions wrongly because they don't understand the questions. I surely believe that learning through your mother-tongue contribute to good performance.

The respondents' views are supported by Dr Neville Alexander of the Project for the Study of Alternative Education in South Africa (PRAESA) who strongly advocated the need for a shift from an English to a mother-tongue based educational system. According to Alexander "If the language of teaching at school is the same as the language of the home, there is a very natural continuity between the home and the school, and in some ways, the good teacher can genuinely take the place of the parent" (Department of Education, 2010:07).

Professor Webb of the University of Pretoria also supports the use of mother tongue as the language of teaching and learning. Prof. Webb cited research which warns of dire consequences for learners who did not learn in a language they understood. He noted that learners who did not learn in a language they were familiar with:

- Participated minimally in classroom discussions;
- Performed below par in relation to other students;
- Experienced feelings of inferiority and low self-esteem; and
- Experienced higher rates of failure and repetition, and were more prone to dropping out from school.

The problems associated with language needs to be acknowledged and addressed. As the 2011 Annual National Assessments show (DBE 2011), Grade 3 and 6 learners are underperforming in their Home language or mother tongue (L1), they perform poorly in their First additional language (FAL) or (L2) which has hitherto been introduced to late, and they therefore perform badly in other learning areas when the language of teaching and learning (LOLT) changes in Grade 4. The problem is cumulative and inevitably affects schooling in Grade 12. The rapid change of the language of teaching and learning (LOLT) is abrupt without learners having acquired sufficient competence in English. As a result, there are many learners who, after many years of schooling, are not able to write even simple sentences, or to do basic Mathematics and fewer able to follow their lessons in

English which is more often than not taught by a teacher who too lacks this competence (Department of education, 2011).

McKay (2012:52) points out that it is unfortunate for many learners who have home languages other than English; insufficient time is given to their first language (L1) development and instruction before a switch to education in a second language (L2). Thus, effective learning is not possible for these children who experience a decline in L1 development together with insufficient acquisition of L2 to ensure successful learning. McKay (2012:53) suggests that the recent introduction by the DBE of the School Workbooks, may contribute to mitigating the problem since it allows for a longer period of L1 learning as a subject. In addition the DBE recommends the introduction of L2 learning (First Additional Language in English) alongside the development of L1 (from Grade R onwards) so that the transition from L1 to L2 language of learning (LOLT) is seamless and learners are readily able to transfer the skills and knowledge as well as cognitive concepts from their learning in L1 to L2.

4.3.8 What, if anything, could be done for the learner now to improve his or her Mathematics learning?

This question was asked to the respondents who are learners, to suggest ways to change the attitudes of learners and thereby improve Mathematics learning. The respondents suggested several strategies and one of them said that:

I think that we must start to learn Mathematics in our mother tongue. We don't understand Mathematics because it is learnt in a foreign language. They say that Xitsonga is an official language but it is surprising that they refuse us to learn Mathematics in Xitsonga.

A grade 7 learner who was interviewed responded as follows: "*I think that they must give us many periods to learn Mathematics because the time is not enough". A grade 2 learner said that "our parents must teach us Mathematics at home or get teachers to teach us at home".*

4.3.9 Do you think parents can make a difference on their children's learning of Mathematics?

The majority of the learners who were interviewed indicate that parents can make a difference in changing the learners' attitudes towards learning Mathematics and also improve learning of Mathematics. One of the learners remarked as follows:

Most of our parents have passed Grade 12 and they can help their children in Mathematics. The teachers must ask our parents to talk to us and tell us that Mathematics is important for their future. The teachers must also stop telling us that Mathematics is difficult.

Another interviewee said that:
Most learners are not serious in learning Mathematics because they don't know why it is compulsory to learn it. I think their negative attitude towards Mathematics is a way of protesting why Mathematics is compulsory.

4.3.10 If you had a choice: Would you continue or stop learning Mathematics? Why?

Very few respondents opted to continue learning mathematics if they had a choice. One of the respondents remarked as follows:

I don't know why? I just don't like Mathematics because it is not my line. I don't understand it, I don't pass tests and it disturbs me. I will stop learning it if I have a choice.

Another learner who is in grade 6 was one of the few learners who like Mathematics and she said:

"I will never stop learning Mathematics because I want to be an engineer and they say that I will not be admitted to study it if I don't have Mathematics. I don't get high marks but I pass Mathematics. I will not stop learning Mathematics.

4.4 CONCLUSION

Chapter four presented the qualitative and exploratory data emanating from the responses in the interviews. The Tech Method of data analysis was used as the qualitative technique for analyzing the data. The following issues were revealed during analysis of the data:

- The respondents answered all the questions in the questionnaire. This indicates that the language used in the questionnaire was understandable to all the respondents and that the questions were deemed relevant and worthy of answering.
- The respondents' responses were widely scattered across the various measuring scales used. Clearly respondents had different views and perspectives on the issues being examined. This suggests too that the instrument did not direct their answers towards any particular response.

The findings of the study, recommendations and conclusions, will be presented in the following chapter.

CHAPTER FIVE

FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

5.1 OVERVIEW OF THE STUDY

This chapter begins by presenting a broad overview of the study, briefly outlining the key content or ideas of each chapter leading to this final chapter. Chapter one focused on the background of the study, problem formulation, purpose statement and research framework. Chapter two presented the review of national and international literature on the attitude of leaners towards learning Mathematics. Chapter three focused on research design and methodology. This includes a discussion of research questions, sampling, data collection and data analysis. The findings of the investigation were presented in Chapter four. The study reveals that several factors contribute to the negative attitudes of learners towards Mathematics. This chapter (Chapter five), will present the findings, recommendations and concluding remarks.

5.2 MAJOR FINDINGS OF THE STUDY

The man focus of this study was to explore the primary school learners' attitude towards Mathematics in the Groot Letaba Circuit of the Limpopo Province. This section presents the findings of the study, with regard to the formulated questions.

5.2.1 How is the attitude of primary school learners towards Mathematics?

The findings of this study revealed that most learners have negative attitudes towards learning Mathematics.

5.2.2 What are the factors which influence the attitude of learners towards Mathematics?

The findings of this study reveal that there are several factors that influence the attitudes of learners towards learning Mathematics, namely;

- Many learners believe that Mathematics is complicated.
- Repeated failure in Mathematics.
- Lack of resources, such as textbooks, in many schools.
- Family members, parents and teachers discourage learners.
- Negative attitudes of teachers.

5.2.3 What is the relationship between learners' attitudes in Mathematics and achievement in this subject?

The findings of this study revealed that learners who regularly perform poorly in Mathematics, develop negative attitudes towards Mathematics.

5.2.4 What is the role of gender on the attitude of learners towards Mathematics?

- Girls have extra negative attitudes towards learning Mathematics because they believe that Mathematics is a male domain. There is a general myth throughout the world that Mathematics needs very strong people, namely; men and that women are too weak to learn it. Girls are also not motivated to learn Mathematics because they see very few women employed in jobs requiring Mathematical knowledge. However, this is gradually changing as more women are entering professions which were regarded as male domain.
- General belief in communities that Mathematics is a male domain.
- In African cultures and other cultures females are not supposed to work. Culturally the place of a female in Africa is in the kitchen which requires no knowledge of Mathematics. General belief in communities that girls should do subjects related to caring, cooking and catering.
- General belief in communities that the intelligence of females is inferior to that of males.

- Community belief that Mathematics is not for the weaker sex (females) but for the stronger sex (males).
- According to African culture women should not go to school.
- Mathematics requires learners to constantly ask questions from the teachers and also engage in discourses with teachers. This is against African culture of not questioning older people.

5.2.5 What are the factors that contribute to the low participation of learners in Mathematics in Groot Letaba Circuit schools?

- Repeated failure in mathematics
- Very few learners pass Mathematics in half-yearly, trial and at the end of the year.
- Due to poverty in many families many parents are not able to buy Mathematical equipment and tools for their children.
- Many learners dislike Mathematics educators.
- Many schools have insufficient classes which result in overcrowding which also complicates effective teaching of Mathematics.
- Many learners in the primary school repeat because of failing Mathematics.
- Learners get little or no motivation from parents, peers, siblings and community members in learning Mathematics.
- Learners are taught by poorly qualified Mathematics teachers who are not committed. .

5.2.6 What are the consequences of negative attitudes towards learning Mathematics?

- Learners always absent from class.
- Many learners don’t pass Mathematics tests and examinations.
- Some learners lock the door to prevent Mathematics educator into the classes.
- Learners don’t participate actively in class.
- Most learners make noise during the lesson presentation.
- Some learners go out of the class during the lesson presentation.
- Many learners don’t write tasks given.
- Some learners fight during the lesson presentation.
- Some learners destroy Mathematics books and equipment of other learners.

5.2.7 The strategies that can be used to motivate learners to learn and performs well in Mathematics.

- Subject specialists should be invited to motivate learners.
- Mathematics teachers must be recruited from other countries.
- Educators must use constructivist methods of teaching.
- Principals and heads of department must motivate the learners.
- Educators must not use lecture methods but allow learners to be active.
- Educators should stop telling learners that Mathematics is difficult.
- Educators must apply different methods of teaching that will cater for the learners' individual needs.

5.3 RECOMMENDATIONS OF THE STUDY

All the stakeholders of the school are responsible for enhancing the learners' attitudes towards Mathematics. In view of the findings of this study, namely; the literature review and the empirical investigation, the following strategies for enhancing positive attitudes of learners towards Mathematics are recommended:

(a) Use of computers

Throughout the country, there is a loud call by education specialists, curricularists, parents and educators for the improvement of Mathematics teaching. It is widely acknowledged that new methods of teaching can go a long way in improving Mathematics performance in South Africa. According to Kilpatrick and Davis (1993), in order to achieve such changes, teachers should move away from traditional teacher-centred classroom practices, such as lectures and drill and practice activities, into a more student-centred context that allows students to work collaboratively and cooperatively to develop learning skills. In responding to the concerns of performance, the Mathematics and Science disciplines within public education are undergoing various levels of reform as educators search for ways to improve education. Other studies revealed that Mathematics teaching, learning and performance can be improved by the use of technology, such as a computer in teaching Mathematics.

The increased use of technology, especially computer technology, in educational processes has been incorporated as a way to improve educational opportunities, while enhancing student performance (Picciano, 2004). A greater emphasis is placed on enabling students to reason and think critically, solve authentic problems, and make more productive use of instructional time to enrich their educational experiences (Lavigne & Lajoie, 1996). Technology in education is neither a new issue nor a recent phenomenon (Eisele & Eisele, 1990). However, technology in the form of computers has changed dramatically over the past fifteen years. The technology tools have gotten smaller, more powerful, and, perhaps most importantly, less expensive (Sorensen, 1996). Through the use of computer and calculator technology, the modern Mathematics classroom is no longer necessarily restricted to the chalkboard and the physical walls surrounding the students (Sorensen, 1996).

(b) Use calculators

Use of calculators in the learning of Mathematics can result in increased achievement and student attitudes. Studies have consistently shown that the use of thoughtful calculators improves student Mathematics achievement and attitudes towards Mathematics. Hembree and Dessart (2006:85) concluded that the use of hand-held calculators improves student learning. One valuable use for calculators is as a tool for exploration and introducing Mathematical content. By reducing computation time and providing immediate feedback, calculators help student focus on understanding their work and justifying and justifying their methods and results (Hembree & Dessart, 2006:86). The graphing calculator is particularly useful in helping to illustrate and develop graphical concepts and in making connections between algebraic and geometric ideas. The calculators should also be used during tests and examinations in order to accurately reflect their meaningful Mathematical performance. Not to do so is a major disruption in the students' usual way of doing Mathematics and an unrealistic restriction because when they are away from the school setting, they will certainly use a calculator in their daily lives and in the work place (Hembree & Dessart, 2006:86).

(c) Use concrete teaching materials

The use of concrete materials is recommended for teaching and learning Mathematics. Long-term use of concrete materials is positively related to increases in student Mathematics achievement and improved attitudes towards Mathematics (Drews, 2007:25). Research suggests that teachers should use manipulative materials regularly in order to give students hands-on experience that helps them construct useful meanings for the Mathematical ideas they are learning (Drews, 2007:25). According to the research findings, the use of the same materials to teach multiple ideas over the course of schooling shortens the amount of time it takes to introduce the materials and helps students see connections between ideas. The findings also indicate that the use of concrete material should not be limited to demonstrations. It is also essential that students use materials in meaningful ways rather than in a rigid and prescribed way that focuses on remembering rather than on thinking.

(d) Create effective learning environment

Learners' attitudes can also be improved by creating an effective learning environment. Creating an ideal Mathematics learning environment begins with the teacher understanding students as learners. It is not only important for a teacher to have content knowledge, but also to develop awareness of how individual students learn (National Research Council, 2000:17). Teachers must make appropriate choices with regard to pedagogy to provide learning opportunities such that students are able to construct their Mathematical knowledge (National Research Council, 2000:17). Teachers can create environments where knowledge is constructed by the student. This environment enables students to build their Mathematical knowledge and understanding of the subject.

Teachers should create environments where knowledge is constructed by the student. This environment enables students to build their Mathematical knowledge and understanding of the subject. The classroom is defined as a constructivist classroom (Capraro, 2001:45).

A ‘mild’ version of constructivism, originating in the work of Jean Piaget, claims that knowledge is actively constructed by the learner and not passively transmitted by the educator (Boudourides, 2008:48). The emphasis is placed on the activity of the individual and reflection of the result of the activity. Students use their current knowledge to construct new knowledge. What they know and believe at the moment affects how they interpret new information (NRC, 2000:25). Students use a process of assimilation and accommodation. Assimilation is where new knowledge is created by building on, or reflecting on knowledge gained previously. Accommodation is when old knowledge beliefs are reshaped to accommodate new experiences (Gadanidis
, 2004:93).

It is believed that the above strategies will go a long way in developing positive attitudes of learners towards learning Mathematics.

5.4 RECOMMENDATION FOR FURTHER RESEARCH

This study focussed on the primary school learners’ attitudes towards Mathematics in the Groot Letaba Circuit of Mopani District. Since the study was mainly focussed on the primary school learners’ attitudes towards Mathematics in the Groot Letaba Circuit of Mopani District only, it could be ideal if similar studies could be extended to other areas of the Mopani District or even the other districts of the Limpopo Province.

In this study the researcher used the qualitative approach. It is, therefore, recommended that further studies be conducted using a mixed method design. The study was also limited by the participants (being limited to teachers and learners). It is recommended that further studies should also involve parents so that the various problems can be probed from parents’ perspectives. Nevertheless, the findings of this study could be vital in improving the attitudes and performance of primary school learners in Mathematics in the Groot Letaba Circuit.

5.5 CONCLUSION

This study explored the perceptions of educators and learners the attitudes of primary school learners in learning Mathematics. The findings of the research revealed there are various factors that are responsible for poor achievement in Mathematics. Most of these factors are influenced by negative attitudes. Attitudes cross many different aspects of everyday life for example, in businesses, motivational speakers are invited and team building exercises are conducted to help inspire employees to have a more positive attitude towards their work in order to increase productivity. In sports coaches spend a significant amount of practice time talking to their players about “believing in success” and reminding players that any team can beat any other team on any given day. Changing people’s attitudes is well known and accepted in today’s society. This philosophy is no different in classrooms than it is anywhere else in society. McCleod (2002) said that attitude toward Mathematics is related to Mathematics success in the classroom. It is therefore important for teachers to improve student work to make a positive change in their attitude toward Mathematics. Good performance of learners also depend on the way the subject matter is presented to the learners by the educators, how the learners actively interact with the learning experiences presented to them and the environment within which the learning takes place. Much demand and emphasis is therefore placed on the teacher to commit to improving the learning outcomes of their students. Based on the analysis of the empirical data presented in this study, major causes of negative attitudes towards learning mathematics are related to.

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APPENDIX A

LETTER TO THE DISTRICT MANAGER ASKING PERMISSION TO CONDUCT RESEARCH

PO BOX 7168
Tzaneen
0850
26 January 2014

The District Manager
Mopani District
P/Bag x 578
Giyani, 0826

Dear Sir/Madam

PERMISSION TO DO RESEARCH IN GROOT LETABA CIRCUIT

1. I am requesting permission to conduct research in Groot Letaba Circuit schools.
2. The research is part of my Master's degree in Inclusive Education at the University of South Africa, under the supervision of Dr. LDN Tlale.
3. The topic of my research is "Primary school learners' attitudes towards Mathematics: A case study of two primary schools in Groot Letaba Circuit, Limpopo Province
4. Two schools will be involved in the study and 14 learners from each school will be selected as the sample of the study. The research will be conducted from the 1st April to 31th May 2014.

Yours Faithfully,
SB Rikhotso

APPENDIX B

A LETTER TO THE PRINCIPALS REQUESTING TO CONDUCT RESEARCH IN THE SCHOOLS

PO BOX 7168
Tzaneen
0850
26 January2014

The Principal School

Dear Sir/Madam

REQUEST TO CONDUCT RESEARCH AT YOUR SCHOOL

1. The above matter bears reference.
2. I am Master's Degree student at the University of South Africa.
3. The title of my dissertation is: "Primary school learners' attitudes towards learning Mathematics: A case of two schools in Groot Letaba circuit, Limpopo Province".
4. 14 learners from your school will be selected as the sample of the study.
5. I have planned to conduct my research from the 1st April 2014 to 31st May 2014 and the interview is scheduled for approximately 45 to 60 minutes.
6. I hope to receive your positive response in this regard.

Yours sincerely,

SB Rikhotso

APPENDIX C

A LETTER TO THE PARTICIPANTS (TEACHERS)

PO BOX 7168
Tzaneen
0855
26 January 2014

Dear Sir/Madam

RE: INVITATION TO PARTICIPATE IN RESEARCH

I hereby request you to voluntarily participate in a one day academic research which I will conduct at your school. I am a Masters' Degree student working on a dissertation with the title: "Primary school learners' attitudes towards learning Mathematics: A case of two schools in Groot Letaba Circuit, Limpopo Province".
You have been selected because of your commitment and hard work in Mathematics. I would like share your views, opinions and experiences. 5 teachers and 28 learners will be interviewed.

The results of the research will help learners and teachers to improve performance in Mathematics. There is no payment for participating in the interview but each participant will enjoy a soft drink during the interview. The interview will be held in the strictest confidentiality and your name will not appear in any document. The interview will be held in private and will last for approximately 45 minutes, and with your permission will be audio recorded for the verification of the findings. You are also free to withdraw from the interview if you are inconvenienced without any penalty. At the end of the research you will be given the findings of the research. You are also informed that the University of South Africa gave the ethics approval of this research. If you have any inquiry, you are free to contact me telephonically at 073 900 6998 or visit me at Makhuva Primary School between 08h00 and 14h00, from Monday to Friday.

If you are willing to take part in this study, please complete the attached consent form. I will appreciate your time taken to participate in this study.

Thanking you in advance

Yours Faithfully
SB Rikhotso

APPENDIX D

CONSENT FORM (Teachers)

- I hereby give free and informed consent to participate in the abovementioned research study.
- I understand what the study is about, why I am participating and what the risks and benefits are.
- I give the researcher permission to make use of the data gathered from my participation, subject to the stipulations he/she has indicated in the above letter.

Signature of the teacher: …….

Name and signature of the researcher: ……

Date: ……...

APPENDIX E

A LETTER TO THE PARENTS

PO BOX 7168
TZANEEN
0850
26 JANUARY 2014

Dear Parent/Guardian

RE: INVITATION TO PARTICIPATE IN RESEARCH

I hereby request your child to voluntarily participate in a one day academic research. The aim of his research is to explore the factors which influence learners' attitudes on Mathematics learning in the primary school. Your child has been selected because of his/her commitment and hard work in Mathematics. I would like share his views, opinions and experiences about learning Mathematics. A total of 5 teachers and 28 learners will be interviewed.

The results of the research will help learners and teachers to improve performance in Mathematics. There is no payment for participating in the interview but each participant will enjoy a soft drink during the interview. The interview will be held in the strictest confidentiality and the name of your child will not appear in any document. The interview will be held in private and will last for approximately 30 minutes, and with your permission will be audio recorded for the verification of the findings. Your child is also free to withdraw from the interview without any penalty. At the end of the research you will be given the findings of the research. You are also informed that the University of South Africa gave the ethics approval of this research. If you have any inquiry, you are free to contact me telephonically at 073 900 6998 or visit me at Makhuva Primary School between 08h00 and 14h00, from Monday to Friday.

If you allow your child to take part in this research, please complete the attached consent form.

Thanking you in advance

Yours Faithfully

SB Rikhotso
(Researcher)

APPENDIX F

CONSENT FORM (LEARNERS)

- I hereby give free and informed consent for my child to participate in the abovementioned research study.
- I understand what the study is about, why my child is participating and what the risks and benefits are.
- I give the researcher permission to make use of the data gathered from my child's participation, subject to the stipulations she has indicated in the above letter.

Signature: ……

Name and signature of the researcher: ……..

Date: ……..

APPENDIX G

A LETTER TO THE LEARNERS

PO BOX 7168
TZANEEN
0850
26 JANUARY 2014

Dear Mr/Ms

RE: INVITATION TO PARTICIPATE IN RESEARCH

I ask you to take part in research which I am doing with the University of South Africa. The aim of the research is to search for the factors which make learners to hate or love Mathematics in the primary schools. I will ask you questions about learning Mathematics. Before I start with the research, I will ask your parents or guardians to allow you to take part. My research will follow all the rules of research. Your name will not appear anywhere on research papers.

We shall meet in the afternoon and I will not disturb your learning. I know that you will be hungry in the afternoon. I will give you food before we start. I will also arrange for transport to take you home if you are staying very far from the school. I am also telling you that you will not get any payment when you take part but you will get food, soft drink and five exercise books. I also want to tell you that you are not forced to take part and you are free to leave anytime if you are not happy. After receiving this letter, please go and discuss with your parents or guardians before signing the form and I will make sure that your parents or guardians receive a copy of the signed assent form. If you have any question to ask me, phone me at 073 900 6998 or visit me at Makhuva Primary School between 08h00 and 14h00, from Monday to Friday.

Yours faithfully
Rikhotso SB (Researcher)

APPENDIX H

ASSENT FORM (LEARNERS)

- I hereby give my voluntary acceptance to participate in the abovementioned research.
- I understand what the research is about, why I am taking part and what the risks and benefits are.
- I give the researcher permission to make use of the information gathered from my taking part.

Signature of learner: ……

Name and signature of researcher: ……..

Date: ……...

APPENDIX I

INTERVIEW SCHEDULE (LEARNERS)

1. What do you think are the benefits of learning Mathematics in primary school?
2. All learners in South Africa are expected to learn Mathematics. Do think this is necessary?
3. Do you enjoy learning Mathematics?
4. Do you enjoy learning other subjects?
5. Do you pass Mathematics tests? If not why?
6. Is your Mathematics teacher a good teacher? Explain your answer.
7. Do you think it is good to learn Mathematics in English and not in your mother tongue? Why?
8. What, if anything, do you think could be done for you now to improve your Mathematics learning?
9. Do you think parents can make a difference on their children's learning of Mathematics?
10. If you had a choice: Would you continue or stop learning Mathematics? Why?

APPENDIX J

INTERVIEW SCHEDULE (TEACHERS)

1. In your opinion, what do you think are the major factors which contribute to the negative attitude of learners towards Mathematics in primary schools?
2. What do you think are the consequences of a negative attitude towards learning Mathematics?
3. Is there any difference between male and female learners with regard to their attitudes to learning Mathematics?
4. Very few learners learn Mathematics in schools in the Groot Letaba Circuit. Explain what could be the factors which contribute to the low participation of learners in Mathematics in Groot Letaba Circuit.
5. Explain the strategies that can be used to motivate learners to learn and performs well in Mathematics.

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