CHAPTER 1
INTRODUCTION

1.1. Introduction and Rationale

Mathematics is an activity that uses observations, representations and investigations, in which new ideas and approaches are created (Department of Education, 2002:21). Mathematics also has its own specialized language that includes symbols and notations to describe numerical, geometrical and graphical relationships (DoE, 2002:21). This unique Mathematical language may present problems as some learners may find it difficult to comprehend this language. According to Kieran (in Essien & Setati, 2006:50), learners often experience misunderstandings in some of the basic mathematical concepts and symbols and these misconceptions are often closely linked to the ways in which they were taught. This may cause confusion in the accurate use of the mathematical language and in turn cause doubt and a lack of self-confidence within the learners themselves (Essien & Setati, 2006:50).

It is of great importance to understand that Mathematics is a subject in which concepts and ideas are built on one another, which in turn will make up a logical structure (DoE, 2002:21). The knowledge formed in Mathematics during the General Education and Training (GET) phase provides a very important foundation from which to proceed into the requirements of Mathematics during the Further Education and Training (FET) phase (DoE, 2006:9). Therefore, developing a strong foundation during the GET phase is crucial for learners to move into the FET phase and ultimately to write their final Mathematics examination paper during their National Senior Certificate (NSC) examination. A strong foundation in Mathematics will enable learners to perform satisfactorily in this subject and this will result in them having

confidence in their mathematical learning abilities. Van de Walle, Karp and Bay-Williams (2010:47) point out that it is important for learners to have confidence in their abilities to do Mathematics and deal with unfamiliar tasks.

Talor (2009) declares that the number of learners, who fail Mathematics, especially since the FET curriculum changed in 2006, is a serious concern as all learners are currently compelled to either take Mathematics or Mathematical Literacy. This means that learners who fail Mathematics will no longer have the option of discontinuing this subject, but will simply have to take Mathematical Literacy as opposed to pure Mathematics. In other words, learners will always be exposed to some form of Mathematics they have to pass even if they cannot cope with it.

During the 2012 National Senior Certificate (NSC) Examination only 225 874 learners registered nationally to write the Mathematics NSC paper compared to 290 407 learners who wrote it in 2009 (SA, 2012:120), indicating a drop-out rate of 22.2% in learners who took Mathematics between 2009 and 2012. The Department of Education (in SA, 2012:120) reported that of the 225 874 learners who wrote the Mathematics paper during the NSC exams only 80 716 of these learners managed to achieve an average of 40% or above. This is a shocking 35.7% of all the learners who wrote this paper nationally. In the Gauteng Province, it was reported that the Johannesburg North district's Mathematics NSC Examination average for 2012 was a low 44.6% (Gauteng Department of Education, 2013). Talor (2009) mentions that the continual low Mathematics pass rate in the NSC-exams is of great concern for the learners, since Mathematics is a requirement for many tertiary institution courses to further their studies. Since the GET phase is supposed to lay the foundation for the NSC-exams these poor NSC results could be closely linked to the poor Mathematics results within the GET phase. Based on the Grade 9

mathematical results during the Annual National Assessment (ANA), The Minister of Basic Education, Angie Motshekga (*in* The Government Communication and Information System, 2012), expressed similar concerns regarding the high failure and drop-out rate in the FET phase, claiming that it is as a result of poor Mathematics results obtained in the GET phase, especially by the Grade 9 learners. The Government Communication and Information System (2012) reported that the National average for the ANA grade 9 Mathematics paper was only an alarming 13%. The Gauteng Department of Education (GDE) (2013) reported that the Johannesburg North District only managed to obtain a slightly higher average of 19%. This call for a closer look into the causes of the poor Mathematics results, but more importantly into understanding the influence of learners' academic self-confidence on their Mathematics achievement, since understanding these aspects may enable educators and learners to improve these results.

Dednam (2011:219) asserts that there are a variety of barriers that can cause mathematical difficulties and some of these barriers can be created by emotional problems within the learner. This includes the factor the researcher would like to focus attention on, namely a low academic self-confidence when doing Mathematics. Dednam (2011:219) also states that since many learners do not believe they can do Mathematics, they will give up easily or refrain from even trying to solve a mathematical problem. This means that they are easily discouraged when faced with a seemingly difficult mathematical problem. Brodie (2006:15) contends that learners need to be confident in their abilities to learn effectively and believe in themselves when faced with a mathematical problem. However, since many learners seem to lack academic confidence when it comes to Mathematics they are faced with a dilemma, as their poor confidence in their ability to learn Mathematics can be linked to their poor mathematical

knowledge and performance (Brodie, 2006:15). For learners to be successful academically, they need to have confidence in themselves as well as in the task at hand. For this to transpire, the learners themselves need to acknowledge the value of their abilities to complete a mathematical task successfully (Woolfolk, 2010:408).

Since all learners are compelled to take Mathematics in one form or another, the poor Mathematics results present an immense cause for concern. This calls for an investigation into the factors that create barriers to mathematical learning in order to effectively overcome this problem. One of these factors could be a lack of academic self-confidence (Dednam, 2011:219). Therefore, during this study the researcher will specifically focus on investigating the influence of learners' self-confidence on their ability to learn and perform satisfactorily in Mathematics, within the GET phase, specifically Grade 9, since it is the GET exit grade.

The school used in this research project is one that has a fixed subject choice that focuses on Mathematics and Science. Learners in this school have to take Mathematics and do not have the option of choosing to take Mathematical Literacy in the FET phase. During the 2012 ANA assessment, the Grade 9 learners from this school achieved an average of 56.6%, with 31.8% of these learners failing the ANA exam. A further 32.7% of these Grade 9 learners did not manage to obtain an average above 50% (Anon, 2012). The researcher chose to investigate whether academic self-confidence has an influence on the learners in this specific school's GET phase's mathematical academic performances in order to determine whether it is a factor within this school specifically.

1.2. Problem Statement

The central research problem to this research is:
What influence does academic self-confidence have on Mathematics achievement?

From this central research problem, the following sub-research questions can be formulated:

- What is academic self-confidence?
- How does academic self-confidence influence the learning of Mathematics in particular?
- What are the mathematical achievements of learners in the GET phase at the school used for this study?
- Is there a link between the academic self-confidence level of learners in the GET phase at the school used for this study and their Mathematics achievements?

1.3. Aim of the Research

The aim of this research is **to establish what the influence of academic self-confidence is on Mathematics achievement.**

To achieve the aim of this research, the researcher will have to:

- Establish what academic self-confidence is.
- Establish how academic self-confidence influences the learning of Mathematics in particular.
- Determine the mathematical achievements of learners in the GET phase at the school used for this study.
- Establish whether there is a link between the academic self-confidence level of learners in the GET phase at the school used for this study and their Mathematics achievements.

1.4. Literature Review and Concept Clarification

1.4.1. Mathematics

Dednam (2011:212) affirms that, as part of the basic survival process, Mathematics has been part of mankind from the start of human existence. Van de Walle (in Dednam, 2011:212) contends that Mathematics consists of three basic concepts, namely:

- it focuses on patterns and associations between different entities;
- it has its own unique language, which requires educators and learners to use and understand precise mathematical terminology. Furthermore Subbiondo (2007) explains that Mathematics is a language that is known all over the world as a result of symbols being used; and
- it is a well-structured field of knowledge with unified, interconnected and co-dependent content and perspectives.

1.4.1.1. Mastering mathematical learning

According to Dednam (2011:211), educators are not the only ones who must accept responsibility for guiding learners to master mathematical learning. In addition to the learners themselves, their peers and their parents should also be actively involved in guiding learners to effectively master mathematical learning, as each experience a learner embraces has the potential of increasing the learner's mathematical knowledge and understanding. Du Plessis, Conley and du Plessis (2008:15) affirm that mastering learning is not a passive process, but rather one in which learners should actively participate. To be able to succeed in this, learners need to be confident in their ability to learn and should not rely on others to feed them knowledge. Mastering

learning has immense value in developing a sense of success and confidence (Donald, Lazarus and Lolwana, 2002:13). It has meticulous value with learners who are faced with barriers to mathematical learning. Furthermore, Berry (2008:44) asserts that learners' desire to gain positive and/or negative opinions, leads to different behaviour patterns that depend on the learners' present level of self-confidence.

1.4.1.2. Preconditions for successful mathematical learning

Mazzocco (2009:2) states that mathematical learning disabilities can also manifest in learners with prerequisite cognitive skills for successful mathematical learning, because these learners are influenced by various aspects, such as poor teaching, Maths anxiety and a lack of academic self-confidence. This affirms that there are several factors, apart from an aptitude for the subject, that influence the successful learning of Mathematics. Some of these requirements include educator, peer and parental assistance and motivation, an understanding of various mathematical concepts as well as continuous hard work and practise of new mathematical ideas and concepts.

1.4.1.3. Development of mathematical learning

Jordan and Levine (2009:60) declare that the development of mathematical learning can be influenced by a learner's social and emotional experiences. Mathematical development starts at a concrete level and advances through a semi-concrete level to an abstract level of knowledge (Dednam, 2011:217).

Mathematical development starts during the infant stages of a learner's life (Jordan & Levine, 2009:61). The development of the basic mathematical skills can be divided into two key elements, namely:

- Primary preverbal number knowledge which forms during the early infant stage and appears to develop without any verbal teaching. Learners experience Mathematics and therefore have confidence in their understanding thereof. This phase forms the foundation for later mathematical learning development.
- Secondary verbal or symbolic number knowledge. During this phase learners start verbalizing mathematical ideas. Some learners become unsure of themselves and a lack of self-confidence emerges.

Learners with barriers to mathematical learning tend to have a lack of confidence and tend to form a mental block surrounding new mathematical ideas (Dednam, 2011:217). Consequently they tend to struggle through subsequent similar examples. In most cases these learners do not even reach the exploration stage in which learners will have enough confidence to explore the concept sufficiently to grasp a full understanding thereof (Dednam, 2011:217).

1.4.1.4. Factors influencing mathematical learning

Bernard's (2006:110) research showed that learners with learning disabilities, including barriers to mathematical learning, have a lower academic confidence level than learners with no disabilities. Dednam (2011:217) further explains that there are two key types of barriers to mathematical learning. The first is intrinsic, barriers within the learner, which include reading problems, emotional problems, and Attention Deficit Disorder- (ADD) related problems. The second barrier is extrinsic, namely external influences on the learner; these barriers may include absenteeism, poor teaching and illness. For purposes of this study the focus was rather on

academic self-confidence which could create barriers to mathematical learning.

1.4.1.5. Resilience during mathematical learning

Donald *et al.* (2002:223) explain that a number of cognitive and personality characteristics appear to help learners recover from a negative setback, such as failing Mathematics. This could be a quick or a slow process the learner struggles with. Bernard (2006:108) affirms that emotional resilience enables a learner to know how to refrain from getting irritated, depressed or stressed about Mathematics being difficult even before starting to solve a problem. This enables a learner to calm down and think logically. Since this study focuses on the influence of self-confidence on mathematical achievement, the next section will examine the issue of self-confidence.

1.4.2. Self-confidence

Woolfolk (2010:89) as well as Meyer, Moore and Viljoen (2003:366) all agree that self-confidence entails the way individual learners see themselves, as well as their knowledge and beliefs about themselves and their abilities, which include their own outlooks, thoughts, attitudes and potentials. Kruger and Adams' (1998:25) research showed that learners' self-confidence differ from one stage in their lives to the next. This means that self-confidence is not a fixed entity, and can thus be positively influenced and motivated. Consequently, if a learner does have a lack of self-confidence, educators, parents and peers should be able to assist in strengthening the learner's confidence, which may help enhance mathematical learning abilities.

1.4.2.1. Academic self-confidence

Learners' self-concept or what he or she "believes" about themselves can also be seen as a learner's self-confidence (Berry, 2008:39). For purposes of this study the researcher will therefore use the term self-confidence.

Kruger and Adams (1998:25) as well as Woolfolk (2010:89) indicate that research shows that self-confidence can be divided into two sub-groups, namely academic and non-academic self-confidence. For this research the researcher will turn the focus to the academic self-confidence of a learner, since she intends to determine whether a relationship exists between learners' ability to learn and perform satisfactorily in Mathematics and learners' confidence in believing they can achieve academic success.

Kruger and Adams (1998:25) reason that adequate achievement and communication within a subject (e.g. Mathematics) will determine the learner's academic self-confidence. According to Woolfolk (2010:90), academic self-confidence develops through continuous self-assessment during a variety of academic circumstances. Learners continuously assess themselves through verbal and non-verbal reactions of their educators, parents and peers which could have positive or negative results.

1.4.2.2. Self-confidence and successful learning

A learner's prior knowledge and confidence in Mathematics is the key to successful learning (Brodie, 2006:17). Donald *et al.* (2002:130) confirm that self-confidence is a multi-dimensional theory that is a key aspect for motivating successful learning. Promoting a learner's sense of being capable; therefore motivating the learner, is an obvious way by means of which educators can build the learner's self-confidence. Furthermore,

Donald *et al*. (2002:130) assert that learners who are motivated to succeed and feel a sense of capability and self-confidence will be more likely to take learning seriously. Such learners will therefore take on more challenging activities to increase their knowledge and abilities to promote successful learning. This kind of behaviour is especially important during mathematical learning, since the third stage (*cf.* 3.6.2) in mathematical learning development consists of exploring more challenging ideas to enable a learner to grasp and understand the mathematical concept.

Building a positive sense of confidence among learners should be one of the most important purposes of teaching in order to promote successful learning (Donald *et al.* 2002:130).

1.5. Research Methodology

1.5.1. Research paradigm

This research is based on the comprehension and the valid and reliable confirmation of the existence of an apparent reality within the research problem; therefore a pragmatic view was followed. Goldkuhl (2004:1) is of the opinion that pragmatism enables researchers to not only notice and research factors that already exist in reality, but also factors that “might” exist. Creswell (2009:11) explains that the pragmatism belief is that the world is not absolute and fixed, but is rather a changing entity. Goldkuhl (2004:1) agrees with this by stating that action could change the existence of a certain reality, indicating that reality changes with circumstances relevant to the time. Consequently one cannot view the reality of the research problem within this study as a fixed and unchanging entity, but rather a phenomenon that depends on the learners who participate, and their views and opinions about the influence their academic self-confidence have on their

mathematical performances. The researcher made use of a mixed research method by combining quantitative and qualitative research within a pragmatic approach (Mastenbroek & Doorenspleet, 2007:10).

1.5.2. Literature review

For the literature review the focus was on two key components, namely:

- The Influence of academic self-confidence, and
- Mathematics Learning.

Different sources were used, for example books, journals, articles, newspapers, internet and web databases (EBSCOhost, SABINET, ERIC, RSAT), to make the literature review as comprehensive as possible.

The key words the researcher used in the academic search include:

- Mathematics Learning
- Self-confidence
- Academic self-confidence
- Mathematical self-confidence
- Barriers to mathematical learning
- Mathematics frustration/anxiety

1.5.3. Research design

During this research study the researcher employed a mixed method approach with an explanatory design. Ivankova, Creswell and Clark (2007:263) affirm that quantitative and qualitative research approaches complement each other when used in a mixed method approach as they allow for a more complete and

inclusive research analysis. Ivankova *et al*. (2007:263) assert that mixed method (*cf.* 4.2.4.1) approaches “can be helpful in gaining in-depth understanding of some trends and patterns”. They define mixed method approaches as a process for gathering, analysing and “mixing” both quantitative and qualitative information in a single study to better comprehend the research problem and draw clearer links between the variables (Ivankova *et al.,* 2007:261). According to Maree and van der Westhuizen (2007:39), mixed methods reduce the risk of chance links as it relies on a diverse range of methods

Ivankova *et al.* (2007:266) state that the purpose of the explanatory design (*cf.* 4.2.4.2) is to use qualitative conclusions to explain the quantitative results in order to better understand the phenomena and the participants’ experiences. This research design enabled the researcher to collect the relevant data in two separate stages of the research study (*Creswell*, 2009:209). The first stage started with the collection of the quantitative data by means of a self-designed Lickert-scale questionnaire; where after the data was analysed. Questions that were derived from this data were then used during the second stage where the qualitative data was collected by means of individual interviews. Both analyses were then used to formulate a combined interpretation thereof. According to Ivankova *et al*. (2007:266), the word explanatory suggests that the qualitative results will explain the quantitative results; thus strengthening the findings.

During the research study a quantitative approach was first used to collect data on learners’ self-confidence levels in the GET phase at a secondary school in Johannesburg North. The data gathered with regard to the learners’ academic self-confidence levels was then compared with their mathematical achievement to establish whether there is a link between the two results of each learner.

The questions of the individual interviews as part of the qualitative approach were based on the findings of the questionnaire. . The qualitative approach consisted of individual semi-structured, open-ended interviews with 15 learners, where the researcher took notes. The interviews were audiotaped to enable her to transcribe it. Nieuwenhuis (2007b:87) defines an interview as a two-way conversation during which the researcher asks the learner questions to collect data in order to learn more about the learner's perception and experiences related to the phenomena. Furthermore, Nieuwenhuis (2007b:87) states that semi-structured open-ended interviews take place as part of a conversation in which the researcher's intention is to jointly explore the learner's views, ideas, beliefs and attitudes, which in this case is, towards their self-confidence levels influencing their ability to learn in Mathematics. The data gathered was then analysed and interpreted together.

A correlation study and phenomenological study were employed as strategies of inquiry.

1.5.3.1. Strategies of inquiry

1.5.3.1.1. Correlation research study

Leedy and Ormrod (2005:108) affirm that a correlation research study (*cf.* 4.2.4.3.1) is a statistical investigation of the relationship between the various variables identified through a factor analysis. Additionally, Leedy and Ormrod (2005:108) also confirm that correlation studies only look at the surface relationships and do not explore the reasons causing them. It examines the extent to which these variables are related. A correlation will exist if one variable increases while the other also increases or decreases in a somewhat "predictable fashion" (Leedy & Ormrod, 2005:180). For this research study the

researcher will look for any correlations between the learners' Mathematics averages (*cf.* 4.2.4.3.1), which represent the learners' mathematical achievement and their levels of academic self-confidence (*cf.* 5.2.2.1). In addition correlations were also drawn between the various factors identified within the questionnaire; to form the themes (*cf.* 5.2.1). Thereafter the researcher identified significant relationships between these various themes (attitude, comprehension and application, problem solving and educator assistance) and the central research problem (*cf.* 5.2.2.2). These correlations will be discussed in more detail in Chapter 5.

1.5.3.1.2. Phenomenological research study

Groenewald (2004:5) states that the aim of a phenomenological research study (*cf.* 4.2.4.4.1) is to describe an experience as correctly as possible by staying true to the essential facts. According to Creswell (2009:13) and Lester (1999:1) phenomenological research is a strategy used for investigating a learner's experiences about a certain phenomenon as experienced and explained by the learners themselves.

1.5.3.1.3. Case study

In addition to the Phenomenological study the researcher also made use of a case study as a strategy of inquiry. This strategy was used to do a thorough investigation of the impact that academic self-confidence has on mathematical performances within the GET phase of one specific school in Johannesburg North (Creswell, 2009:13).

The data collection strategies that were used will be briefly discussed next

1.5.4. Data collection strategies

Quantitative data was collected by means of a self-designed Lickert-scale questionnaire, which was answered by 190 voluntary participants from the GET-phase. This data was then statistically analised and common themes where identified. To collect data for the qualitative part of the research study, the researcher conducted semi-structured interviews with 15 learners from the sample group. These interviews were then coded to look for common themes. More detail with regards to these strategies will be provided in Chapter 4.

1.5.5. Trustworthiness, validity and reliability

Validity and reliability within quantitative research is defined by Maree and Pietersen (2007a:147) as:

- Quantitative Validity: when the instrument (the questionnaire) measures what it is said to measure.
- Quantitative Reliability: the consistency of the instrument (the questionnaire).

The researcher conducted a pilot study (*cf.* 4.2.4.3.1), to ensure content validity of the instrument, as recommended by *Creswell* (2009:150). Internal reliability was determined by measuring Cronbach's alpha coefficient which is based on the inter-items correlation (Pietersen & Maree, 2007b:216), to confirm consistency of the questionnaire (*cf.* 4.2.4.3.2).

According to Creswell (2009:190), validity and reliability do not have the same meaning in qualitative research as is the case in quantitative research. He describes these terms as follows:

- Qualitative Validity: the researcher checks for the truth of the results by making use of certain measures.

- Qualitative Reliability: indicates that the approaches used by the researcher are consistent throughout the research project.

This can be done by ensuring trustworthiness of the qualitative research.

To ensure trustworthiness for the qualitative research study, the researcher will address the four principles (please see 4.2.4.4.3 for a detailed discussion) as proposed by Guba (*in* Shenton, 2004:64), namely:

- Credibility
- Transferability
- Dependability
- Conformability

1.5.6. Role of the researcher

Qualitative research involves a continuous and intensive understanding of the participants, which introduces a variety of strategic, ethical and personal issues into the research process (Creswell, 2009:177). Bearing these concerns in mind, Creswell (2009:177) advises that the researcher needs to address factors that may shape their interpretations during the research study. Therefore the researcher had the following role (*cf.* 4.2.5), as recommended by Creswell (2009:177):

- She describes all the steps she took to gain entry to the research site as well as addressing ethical issues.
- She requested permission from all parties involved in this research study (e.g. the GDE, principal of the school, parents of the participants and participants themselves).
- She ensured that all parties were well informed regarding the aim of this research study.

- She employed the necessary strategies to ensure the validity and trustworthiness of the research data.

1.5.7. Population and sampling

1.5.7.1. Population

The population considered for this research study were all learners in the GET phase of a secondary school in Johannesburg. According to Govender (2009:3), this school was established in 1993 for learners from previously disadvantaged communities. Learners in this school come from diverse cultural and religious backgrounds. This school has a set subject choice, and learners are therefore compelled to take pure Mathematics in the FET phase. Furthermore, Govender (2009:3) confirms that this school was the top Maths school in 2008, among South African government schools. The school is situated in Central Johannesburg, Crosby, and forms part of the D10 district in Gauteng.

1.5.7.2. Sampling

For the quantitative sampling method that was used by the researcher is convenience sampling. This sampling method was chosen as a result of the sample being easily and conveniently accessible (Maree & Pietersen, 2007b:177). The first part of the study included all willing GET phase learners of a secondary school in Johannesburg North (D10), where data was collected by means of a questionnaire that determined the learners' self-confidence levels with regard to Mathematics.

The qualitative sampling method used was purposive sampling (*cf.* 4.2.7). According to Maree and Pietersen (2007b:178) purposive sampling may be used when the researcher has a specific purpose

in mind, and since the researcher wanted to specifically interview 5 learners with various performance abilities in Mathematics, this sampling method was ideal. Three lists were compiled using the learners' Mathematics term averages, namely:

1. Poor Mathematics Achievements: All learners with marks below 50%
2. Average Mathematics Achievements: All learners with marks between 50% and 75%
3. Good Mathematics Achievements: All learners with marks above 75%

All three lists were then arranged in order of the learners' mathematical academic achievements. Leedy and Ormrod (2005:139) regard a typical sample size for a phenomenological research study as being between 5 and 25 learners. Consequently, a random sample of 15 learners was taken from these lists with whom individual interviews were conducted. Five learners from each list were randomly chosen which ensured that learners with different mathematical achievements were included in this study (*cf.* 4.2.7)

1.5.8. Ethical aspects

As Creswell (2009:87) indicates, the researcher needs to foresee ethical issues that may arise during the research studies. During this research study data will be collected regarding the learners' confidence levels and their experiences with regard to their ability to learn Mathematics. Therefore, it is of great importance to protect the learners who participate in this study (Creswell, 2009:87). The researcher needed to build a trusting relationship with the learners who willingly and actively participated in this research study. The researcher also needed to promote the integrity of the research project and guard against any form of misconduct that might have reflected negatively on the

participating school and the Gauteng Department of Education (GDE), and actively dealt with new and challenging problems.

The researcher requested permission from the following parties involved in this study (see Addendums D-G):

- The Gauteng Department of Education
- The principal of the school
- The parents of learners in the GET phase
- The learners in the GET phase

Participation in this research project was completely voluntary, and no learner was forced to participate unwillingly. All data collected was dealt with confidentially. An ethical application has been submitted to and approved by the Ethics Committee of the North-West University, Vaal Triangle Campus (Addendum C).

1.6. Definitions of Key Concepts

Mathematics Learning: The process of obtaining knowledge and skills about numbers, symbols, quantities and abstract concepts through being taught, study and/or experience (Oxford University Press, 2013).

Self-confidence: The sense of trust a person has in their own abilities (Oxford University Press, 2013).

Academic self-confidence: A learners' confidence towards their own ability to perform academically (Alias & Hafir, 2009:6).

Mathematical self-confidence: A learners' sense of trust in their own abilities to use numbers, symbols, quantities and abstract concepts (Oxford University Press, 2013).

Barriers to mathematical learning: Factors that cause difficulty in and/or prevents the successful learning of Mathematics (Oxford University Press, 2013).

Mathematics frustration/anxiety: An intense sense of concern, nervousness, tension and restlessness which prevents the successful learning of Mathematics (Oxford University Press, 2013).

1.7. Chapter Division

Chapter 1: **Introduction**

The introduction will provide a background and description of the central problem. It will specify what the aim and purpose of the research study in general will be. When reading the Introduction the reader should have a clear idea as to what will follow.

Chapter 2: **Defining self-confidence**

In this chapter self-confidence and mathematical confidence will be clearly defined. In addition to this, literature will be used to identify already known links between self-confidence and Mathematics. Factors will be identified that have an influence on a learners self-confidence, and known methods will be stated that could help build-up a learners confidence.

Chapter 3: **Factors that influence mathematical learning**

In this chapter factors will be discussed that influence mathematical learning positively and negatively. Barriers to mathematical learning will be identified and discussed in depth. Known methods to overcome barriers to mathematical learning will be discussed.

Chapter 4: **Research methods**

The methods used to successfully complete this research study will be explained and discussed.

Chapter 5: **Data analysis, interpretation and report of the research**

Raw data will be analyzed, and will be given in the form of transcribed interviews, statistics and graphs. A clear explanation of the researcher's interpretations and findings will be given and a report on the findings will be written.

Chapter 6: **Conclusions and recommendations**

The researcher will use all the gathered information and data, to derive a relevant conclusion as to what the influence of self-confidence is on Mathematics. The researcher will also make recommendations for further research.

1.8. Conclusion

Mathematics is being regarded by educationists as a crucial subject for learners to be able to perform in an academic setting as well as in a world of work. However, it has always been a challenging and scary subject for many learners, which may result in these learners not performing in this subject and consequently not attaining a Senior Certificate. It also closes many doors for continued further studies. It was assumed by the researcher that low self-confidence may have a negative influence on a learner's ability to perform satisfactorily in Mathematics. Henceforth the researcher investigated this in order to prove or disprove the influence thereof. In the process of investigating the truth behind this statement, the researcher attempted to develop recommendations to improve learners' self-confidence, in order to enhance their performance in Mathematics. The intention of this research was to create awareness that self-confidence has a vital

influence on the achievement or not of learners in Mathematics, and needs to be addressed.

In the following chapter the first literature review chapter will address the issue of self-confidence