CHAPTER 2
DEFINING SELF-CONFIDENCE

2.1. Introduction

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

2.2. Self-Confidence

According to Woolfolk (2010:89) as well as Meyer *et al.* (2003:366) 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 potential. Self-confidence is a personality trait which enables learners to have positive and realistic views of themselves and the current situations they may find themselves in (Sieler in Alias & Hafir, 2009:1). Furthermore, Renchler, Atkinson and Feather (in Stohl, 2010:16) state that a sense of self-confidence is the belief that one can achieve success and therefore become more motivated to attempt certain tasks, as well as develop a fixed philosophy about their own chances of achieving success and/or failure.

Manktelow and Carlson (2011) as well as Alias and Hafir (2009:1) affirm that there are two things that adds to self-confidence, namely self-efficacy and self-esteem.

2.2.1. Self-efficacy

Self-efficacy is learners' confidence in their personal competence in a certain area of their lives, for example their academic competence (Woolfolk, 2010:350). Learners gain a sense of self-efficacy when they master skills and achieve success (Manktelow & Carlson, 2011). Alias and Hafir (2009:1) add that self-efficacy is learners' belief that they have the capability to be successful.

2.2.2. Self-esteem

Woolfolk (2010:91) states that self-esteem is learners' judgment of self-worth which includes feeling proud of oneself and confident in one's own abilities. Manktelow and Carlson (2011) add that learners' self-esteem is a sense that they can cope with what is currently happening in their lives. According to Alias and Hafir (2009:1), self-esteem is a general feeling of importance and self-worth.

Self-confidence differs between learners who are in the same situations, since all learners are different and experience certain situations differently from others (Sander & Sanders, s.a.:3). For example, two learners from the same class are given a difficult algebraic problem to solve; one learner may feel confident in his/her problem-solving ability and see this experience as a challenge, whereas the other learner who does not feel confident might immediately say that he/she cannot solve the problem, without even attempting to do so. Kruger and Adams' (1998:25) research showed that learners' self-confidence differs from one stage in their lives to the next. This happens when learners learn a completely new mathematical concept (e.g. adding variables in Grade 8); learners might feel hesitant to apply their knowledge at first. However, continuous exercising throughout the year enables them to build confidence in making use of this concept without

even thinking. A situation that was stressful at first becomes easier with practice. This means that self-confidence is not a fixed entity, and can thus be influenced and motivated positively by educators; parents and peers who might be able to assist in strengthening the learners' confidence, and help enhance their mathematical learning abilities.

2.3. Academic Self-Confidence

Academic self-confidence refers to learners' confidence in relation to their academic achievement. This type of self-confidence differs from personal self-confidence, as academic self-confidence relates more to academic achievement rather than to personal, emotional and social abilities. Academic self-confidence can effortlessly be subjected to situational elements, e.g. if learners do better in certain mathematical problems they feel more confident in their abilities to solve these problems in future. They state that academic self-confidence is the mediating factor for learners' academic achievements, and can easily be influenced by verbal opinions and feedback, positive or negative, by the learners' educators, parents and peers (Alias & Hafir, 2009:6).

According to Kruger and Adams (1998:25) as well as Woolfolk (2010:89), research shows that self-confidence can be divided into two sub-groups, namely academic and non-academic self-confidence. Non-academic self-confidence is a learners' lack of personal self-confidence, regarding the way they see and believe in themselves (Woolfolk, 2010:89) (*cf.* 2.2). The intention of this research study was to determine whether there is a relationship between a learner's ability to learn and perform satisfactorily in Mathematics and a learner's self-confidence in believing that he/she can achieve academic success.

Kruger and Adams (1998:25) reason that adequate academic achievements and communication in the subject will determine the learner's academic self-confidence. For example if a learner is teased by his peers, or his educator yells at him each time he gives an incorrect answer, he will most likely feel inadequate and not confident in his ability to do Mathematics. According to Woolfolk (2010:90), academic self-confidence develops through continuous self-assessment during a variety of academic circumstances. Learners will assess themselves through verbal and non-verbal (such as facial expressions and body language) reactions/feedback from their educators; parents and peers, which could result in positive or negative academic achievement, depending on the way they experience these reactions. A variety of people (such as educators, parents and peers) can have an influence on how learners feel about their own abilities to perform academically (Kruger & Adams, 1998:26). Therefore it is obvious that a learners' self-confidence is not merely influenced by their self-assessment, but also by the attitude of their teachers, parents and peers towards them.

According to Sander and Sanders (s.a.:3) self-confidence differs between learners even in the same situations. For example, some learners may feel self-confident in their abilities to solve Geometric problems, whereas another learner, in the same class with the same educator, may feel terrified at the thought of solving the exact same Geometric problems. This may be as a result of their different level of skills in doing Geometry. Consequently their experiences in solving these problems are different and therefore their self-confidence levels will also differ.

According to Williams (2009), intelligent learners with high IQ's (Intelligent Quotients) do not always do well in their school subjects. Phillips (in Woolfolk, 2010:90) states that some learners "seriously underestimate" their own abilities because of their lack

of self-confidence. These learners truly believe they are not able to perform in Mathematics; they believe they are not capable of understanding mathematical ideas, and keep reminding themselves of this before attempting to solve mathematical problems. This results in poor Mathematics achievement. Academic self-confidence is a mediating variable between learners' hereditary skills, their learning styles and their ability to achieve academic excellence (Sander & Sanders, s.a.:4). When learners feel confident in their skills and ability to learn Mathematics and when they truly believe in themselves, they tend to become more successful in their ability to learn and understand Mathematics. According to Williams (2009), research done by psychologists that focused on self-confidence mostly assumed that traits such as self-confidence are shaped by parenting and parental beliefs and expectations. However, Bandura (in Williams, 2009) argues that traits such as self-confidence can be inherited and centred within certain families. He also maintains though that it is important to bear in mind that self-confidence is not a rigid trait, and that as learners develop socially and emotionally over time, self-confidence can be moulded and improved.

2.4. Self-confidence in Different Developmental Stages

Research revealed that learners' self-confidence differs from one stage in their lives to the next; this may be the result of cognitive development over a period of time in the learner's life (Kruger & Adams, 1998:25). Donald *et al.* (2002:63) describe the process of cognitive development as learners' ability to be actively involved in the on-going process to adjust to their world. The process of cognitive development is an important aspect in the development of a learner's academic self-confidence. The reason for this being that as learners' cognitive abilities develop, their confidence in doing certain tasks improves as well. This development changes and enhances through certain stages of a learner's life. There are

many theories describing the different stages of development in a person's life.

2.4.1. Piaget's theory

According to Piaget (Donald *et al.*, 2002:65; Huitt & Hummel, 2003) there are four stages of cognitive development, namely:

- Sensory Stage - birth to two years
  In this stage infants will use motor activity to demonstrate intelligence. Although infants only have partial knowledge and intelligence regarding their environment and surroundings, it develops through their experiences with their senses (e.g. hearing, sight, touch, taste and smell).
- Pre-operational Stage - two to seven years
  During this stage a child's intelligence will be measured by the use of verbal communications, use of symbols and imagination and their ability to remember and memorize. However, their thinking abilities are not logical.
- Concrete Operational Stage - seven to eleven years
  Intelligence in this stage is demonstrated through logical, systematic as well as operational thinking and the exploration of symbols related to the tasks at hand (e.g. schoolwork).
- Formal Operational Stage - from eleven years onwards
  In this stage adolescents demonstrate the ability to logically use symbols connected to abstract ideas, as well as the ability to think in a formal operational manner.

As these stages of cognitive development unfold, learners would become more self-confident in their reasoning abilities, and consequently their ability to perform academically (Huitt &Hummel, 2003).

2.4.2. Erickson's theory

Dr Eric Erickson, on the other hand, sub-divided a person's physical, emotional and psychological development into eight stages (Nursing Resource, 2010; Boeree, 2006):

- Oral-Sensory Stage – birth to two years
  This stage is also known as the **trust vs. mistrust stage**. An infant develops a sense of trust and happiness when loved and cared for by parents. In the same way an infant who is neglected and abused will develop a sense of mistrust and will display a lack of curiosity and confidence.
- Anal-Muscular Stage – two to three years
  This is also better known as the **Autonomy vs. Shame and Doubt Stage**. Toddlers who show a sense of autonomy will confidently explore their environment, continuously, finding new mental stimulation on their own. These toddlers have an active imagination and do not need to be entertained by adults. Whereas toddlers who doubt themselves and have feelings of shame, will have a lack of self-confidence and will not explore and discover new surroundings on their own.
- Genital-Locomotor Stage – four to five years
  This stage is also known as the **Initiative vs. Guilt Stage**. Children with initiative will be able to complete tasks on their own; they can express themselves confidently and successfully. Whereas children with a sense of guilt will rather seek a new challenge before completing something they had started, they tend to rather hold back.
- Latency Stage – six to eleven years
  This is known as the **industry vs. inferiority stage**. Learners with a sense of industry will be confident and

interested in their schoolwork or other tasks and will actively seek new challenges. They display a responsible attitude towards their peers, parents and educators. However, children who show signs of inferiority will not show interest or confidence in their schoolwork or other tasks as they feel they are not “good enough” to be successful.

- Adolescence / Puberty Stage – twelve to eighteen years
  This is also called the **identity vs. role confusion stage**. Adolescents with a sense of identity know what they want from life, they are self-confident, goal-orientated and positive about their future and where their life is headed. On the other hand, adolescents with a sense of role confusion may tend to feel overwhelmed and unsure about their future, they tend to be aimless in their decisions and show signs of low levels of self-confidence and self-esteem.

Three more stages are identified by Erickson (in Nursing Resource, 2010). However, these stages are irrelevant to this study. These stages are:

- Young Adulthood – nineteen to forty years
  The **intimacy vs. isolation stage**.
- Middle Adulthood – forty to sixty-five years
  The **generativity vs. self-absorption stage**.
- Late Adulthood – sixty-five years to death
  The **integrity vs. despair stage**.

Erickson’s theory of psychosocial development is more centred on a one’s choices in life and the conflicts one needs to face during life. Learners may make mistakes when making certain choices in their attempts to solve a problem. They can, however, learn from these mistakes. By learning from their mistakes it enables them to

make informed and confident choices when faced with a similar problem. Through learning from their own mistakes they tend to build their own academic self-confidence for the future (Nursing Resource, 2010).

2.4.3. Conclusion

Since self-confidence differs from one stage in a learner's life to the next (Donald *et al.,* 2002:63), it is not a fixed entity, and can thus be influenced and motivated positively by educators, parents and peers. Therefore it can be assumed that if a learner does lack self-confidence then educators, parents and peers must be able to assist in strengthening the learner's confidence, to help enhance his/her mathematical learning abilities.

2.5. High Self-Confidence vs. Low Self-Confidence

According to Manktelow and Carlson (2011), learners' levels of self-confidence can be identified in many ways by studying their behaviour and reactions towards certain situations in their lives. Learners with high self-confidence levels have a reasonably good idea of their abilities, whereas learners with low self-confidence levels struggle to fully comprehend their own abilities (Alias & Hafir, 2009:1).

Manktelow and Carlson (2011) made the following comparisons between learners who are self-confident and learners who have low levels of self-confidence:

Table 2.1: Identifying aspects between being self-confident and having low levels of self-confidence.

Learners with self-confidence	**Learners with low self-confidence**
Will do what they believe to be best, even if other people may disagree.	Will follow other people, or do what they think other people will approve of.
Will take risks and do everything possible to achieve success, even if this means that they need to work through attempts that may fail at first.	Will not take risks, but will rather stay in their comfort zone as this is their way of trying to avoid failure. They fear failure more than striving for success.
Will admit to their mistakes, and find positive learning opportunities from it.	Instead of admitting their mistakes, they would rather try to cover up these mistakes.
Will not seek praise, but will rather wait for others to congratulate them on their accomplishments.	Praise their own accomplishments and make sure everyone around them notices it.
Accept complements politely.	Dismiss complements

2.6. Self-confidence in Mathematics Associated with Different Genders

Hannula, Maijala and Pehkonen (2004:18) state that "gender differences favouring males in confidence in Mathematics are well recorded." Female learners show less interest in pursuing Mathematics for further education and future careers than do male learners (Christou, Phillipou & Menon, 2001:47). A reason for this, according to Christou *et al.* (2001:47) and Barkatsas, Kasimatis and Gialamas (2008:563) can be that female learners possess less confidence in their mathematical abilities than male learners

and are not as engaged in Mathematics as male learners since they tend to be more fearful and less confident about their mathematical abilities. Marsh (in Christou *et al*, 2001:47) affirms that male learners have a stronger link between their academic self-confidence and their abilities to do well in Mathematics. Many female learners have the opinion that male learners are better in Maths, and therefore do not achieve good results in Mathematics, which may cause a decrease in their ability to learn Maths (Starkey, 2010:2). Nuttall and Pezaris (2001:29) declare that the largest difference in achievement can be found in male learners' ability to do well in Geometry, solving problems and doing measurements, estimations and proportional thinking.

Barkatsas *et al.* (2008:569) state that educator expectations and peer pressure may influence female learners' mathematical confidence negatively. Therefore, educators need to use a variety of strategies to build male and female learners' confidence levels for schools to generate the mathematicians needed for the 21st century (Huebner, 2009:91). In order to help build female learners' mathematical confidence, Skolnick, Langbort and Day (in Starkey, 2010:3) suggest that improving problem-solving skills will develop better mathematical skills and consequently increase academic self-confidence in females.

2.7. Self-Confidence and Maths Anxiety

Maths anxiety can be a very complex topic (Furner & Berman, 2004:3). It involves situations learners find themselves in, in and out of the classroom. Hall (2003:185) asserts that anxiety can be caused by factors such as unnecessary comparisons with fellow learners, thoughts of failure and the costs thereof, low levels of self-confidence, worrying about assessments and fear of disappointing their parents and educators. Academic self-confidence and Maths anxiety should be treated as vital aspects

of achievement in Mathematics since high levels of Maths anxiety can be linked to learners' confidence in their ability to learn Mathematics (Boekaerst, 1997:8; Starkey, 2010:1).

Furner and Berman (2004:3) believe that Maths anxiety can be prevented by instilling academic self-confidence in a learner. In order to achieve this type of self-confidence they suggest that educators should:

- Take into consideration that learners have different learning styles;
- create a positive testing and/or assessment atmosphere,
- create positive learning experiences within the Maths classroom;
- emphasize that everyone can make mistakes in Maths and that no one should be ashamed of it;
- make Maths relevant to everyday life;
- allow learners to evaluate their own abilities; and
- allow learners to use different approaches to learn Maths.

2.8. Self-Confidence and Meta-Cognition

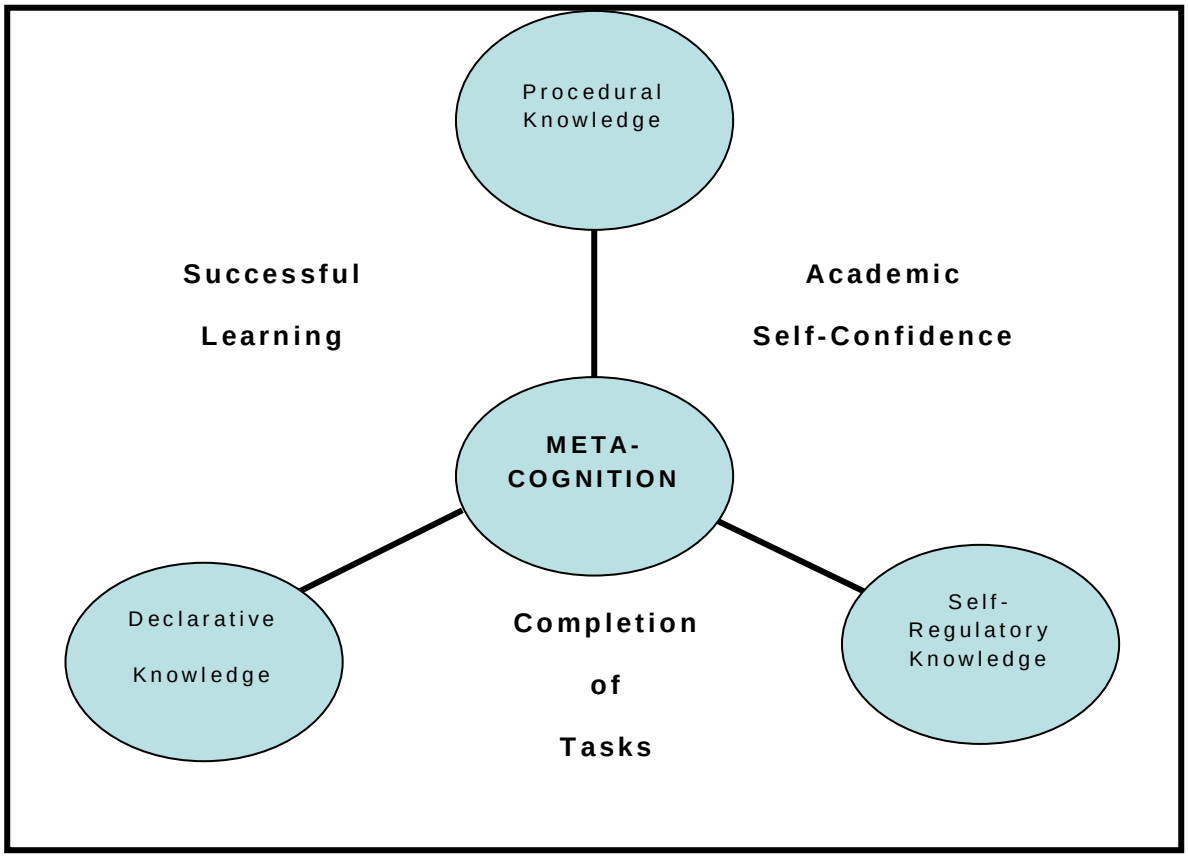
Donald *et al.* (2002:105) define meta-cognition as a learner's awareness of what goes on in their own mind and how they understand what they think, plan, reflect and learn. Meese (in Dednam, 2011:216) agrees by defining meta-cognition as one's understanding of one's personal thinking processes and learning abilities. Meta-cognition is a higher-order cognition used to check and control cognitive processes such as calculations, understanding, problem solving etcetera, which is crucial for the successful learning of Mathematics.

Skills such as planning, monitoring and evaluating allow learners to regulate their ability to think and learn (Woolfolk, 2010:270).

These three skills are equally important in the successful learning of Mathematics. Learners need to effectively plan how to attempt a mathematical problem, how much time they will need and which steps and strategies to use. Thereafter they need to monitor their progress. This will help learners to see the reasonableness of their calculations. Lastly they need to evaluate and judge the correctness of their answers.

Woolfolk (2010:270) affirms that meta-cognition involves three types of knowledge which, if used with confidence, ensure successful completion of a task and/or learning, namely declarative, procedural and self-regulatory knowledge.

Diagram 2.1:Meta-cognition and the three types of knowledge used to ensure successful learning with confidence (Woolfolk, 2010:270).



These types of knowledge will be discussed in the following paragraphs:

2.8.1. Declarative knowledge

Declarative knowledge is the learners' knowledge of themselves and of the aspects that control their learning abilities, and knowing which skills, strategies and resources are needed to successfully complete tasks and/or learning (Woolfolk, 2010:270), i.e. knowing what to do. These are all aspects that are essential for confidently solving mathematical problems. Uluoglu (2010) in turn defines declarative knowledge as the factual information accumulated in a learner's memory. An example of declarative knowledge is knowing the formula of a certain mathematical problem and feeling confident to be able to solve a mathematical problem (Peirce, 2003).

2.8.2. Procedural knowledge

Procedural knowledge is the learners' knowledge of how to use their skills and strategies and make most use of the resources at hand in order to successfully learn and/or complete a task (Woolfolk, 2010:270), i.e. knowing how to make use of their knowledge. Uluoglu (2010) confirms that "procedural knowledge is the knowledge of how to perform, or how to operate." Learners who rely more on procedural knowledge are more skilled in problem solving (Uluoglu, 2010). Peirce (2003) explains that this is the knowledge a learner needs on how to use the chosen formula and follow the correct steps to solve the mathematical problem with confidence.

2.8.3. Self-regulatory knowledge

Self-regulatory knowledge is used to guarantee that a task is fully completed (Woolfolk, 2010:270), i.e. knowing when and why to apply certain methods to successfully learn and/or complete a task (Peirce, 2003). Hall (2003:183) affirms that self-regulatory knowledge also helps learners to overcome their failures in successful learning and in overcoming their failures their academic self-confidence grows. Learners who make use of self-regulatory knowledge can confidently weigh their options and make a decision on the best solution to a problem (Peirce, 2003). Therefore these learners have a higher level of academic self-confidence. An example of this kind of knowledge is when a learner decides on which method to use in order to solve a word problem in Mathematics.

2.8.4. Conclusion

Legg and Locker (2009:479) state that "*increased meta-cognition is associated with greater confidence in performance*." Meta-cognition promotes successful learning as it develops learners' confidence in their own abilities to solve problems (Peirce, 2003).

2.9. Self-Confidence and Successful Learning

According to Watkins, Carnell, Lodge, Wagner and Whalley (2002:1) successful learning can be defined as a reflecting process in which learners can make use of prior-knowledge and experiences to enable them to understand and grasp new work. Learners' 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 to motivate successful learning. With high self-confidence comes academic success (Stohl, 2010:16).

Promoting learners' sense of being capable, therefore motivating the learners is an obvious way through which educators can build learners' self-confidence.

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 consequently 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.) Learners who have academic confidence are more likely to be interested in Mathematics and will be more eager to take Mathematics from grade 10 to grade 12 (Johnston-Wilder & Lee (2010:38.

Woolfolk (2010:90) affirms that mathematical self-confidence has a direct effect on a learner's abilities to successfully learn and understand mathematical ideas. Learners with a high sense of self-confidence will believe in their own ability to solve a problem successfully, because they view difficult problems as a challenge to master rather than pass up the opportunity to even try. This may prove to be the most important difference between failed or successful learning (Alias & Hafir, 2009:1).

According to the TIMSS (Third International Mathematics and Science Study) report (in Nuttall & Pezaris, 2001:32) there are indications that academic self-confidence may be a crucial factor for learners to successfully learn at a grade 8 level. This is an important link to this research study as the focus of this study is specifically on the influence of academic self-confidence on Mathematic achievement in learners from grade 8 and 9.

Booyse (2006:148) is of the opinion that key characteristics of the "gifted underachiever" are a lack in self-confidence and feelings of inadequacy. This means that even exceptional learners, who do have a mathematical aptitude, may find it difficult to be successful in their mathematical learning if they lack self-confidence.

In contradiction to the notion that self-confidence influences and promotes successful learning as discussed above, Schoenfeld (in Starkey, 2010:1) claims that learners' mathematical confidence is strongly influenced by their ability to learn Mathematics and consequently solve Maths problems. Consequently, helping learners to solve problems successfully may also help these learners to increase their confidence in their ability to effectively learn and complete mathematical tasks (Starkey, 2010:1). Boekaerst (1997:28) states that learners who are self-confident before solving a mathematical problem tend to assign resources effectively to learning Mathematics; therefore making successful mathematical learning possible. Poor mathematical performance can be attributed to a lack of confidence and motivation. It is imported to note that successful learning is also a key component to achieve academic success (Signer, Beasley & Bauer 1997:378).

2.10. Research on Self-Confidence and Academic Achievement

Tavani and Losh (2003:141) point out that there is a significant positive relationship between motivation, resilience, expectations and self-confidence, which also have an important role as predictors of academic performances and achievements, especially during the learners' high school career. However, only a limited amount of research has been done on the extent in which these variables influence academic achievements (Tavani & Losh, 2003:142). Consequently, there is a need for more in-depth

research on these internal factors and what exactly their influences on academic performances are. This could assist learners, educators and parents in determining the importance of factors such as self-confidence in their academic activities and consequently help learners in making informed subject choices for their future academic careers. For example, if self-confidence has a positive influence on academic achievement and learners have high levels of academic self-confidence in Maths, they would know that this could be a sound subject choice for the FET phase.

Van Tassel-Baska, Feng, Swanson, Quek and Chandler (2009:702) have done a study on an enrichment program for gifted learners. In their study on academically gifted learners, van they found that 22,9% of the educators and 35,1% of the parents who participated in the study expressed feelings that academically gifted learners have high levels of self-confidence. Mowschenson and Weintraub (2009:752) affirm that parents believe that academic self-confidence has an influence on their children's abilities to succeed academically. However, 20,8% of the educators expressed the concern that some of these academically gifted learners may experience a lack of self-confidence. One of these educators teaches Mathematics and expressed concerns regarding one of these academically gifted learners who lack self-confidence. The educator stated that this learner easily gave up on doing questions if he did not "get it". Instead of trying to do the question this learner would simply move on to the next question. However, van Tassel-Baska *et al.* (2009:719) state that 72,2% of the learners in the same study were of the opinion that this academic program for gifted learners increased and built their self-confidence. They came to the conclusion that after 3-4 years in the gifted program learners had improved academic achievement and enhanced their self-confidence levels.

According to Herbert and Stipek (in Huebner, 2009:90), Barkatsas *et al.* (2008:563), as well as Carcalho and Isobe (in Filho, 2009:95) studies done on learners' belief in their own academic abilities and achievement showed that some learners rated their own ability lower than others, even when these learners had the same academic abilities in Mathematics. Barkatsas *et al.* (2008:563) and Fuchs, Fuchs and Compton (2010:25) as well as Stohl (2010:12) found that in adolescent learners with longstanding academic difficulties poor academic self-confidence were revealed and therefore mathematical self-confidence can be closely associated with mathematical achievement. Mapolelo's (2009:315) study has shown that learners identified confidence as one of the four key factors to achieve success in Mathematics. The other three factors are natural talents in Maths, amount of time and work spent on exercising and learning Maths and lastly good instructions.

In contrast Woodman, Akehurst, Hardy and Beattie (2010:468) state that some effects of high confidence levels may have a negative influence on a learner's academic achievements. This may be the result when some learners become overconfident and in turn this can reduce their goal-orientated focus, which can lead to lower performances and achievement. This happens when learners are close to achieving their goals and their confidence gives them a false degree of self-satisfaction regarding the task at hand (Woodman *et al.*, 2010:468)

2.11. Building a Learner's Self-Confidence

According to Starkey (2010:3) educators need to build their learners' confidence in order to enhance these learners' ability to succeed in Mathematics. Learners should have a positive attitude towards Mathematics before they can build their academic confidence in their own ability to achieve success in Mathematics

(Furner & Berman, 2004:1). According to Johnston-Wilder and Lee (2010:38), mathematically resilient learners are more likely to successfully learn Mathematics (*cf.* 3.9). Mathematical resilience builds confidence in understanding and learning Mathematics; thus it enhances academic and mathematical confidence.

DeRoche (2011) affirms that educators can add to learners' self-confidence by:

- supporting their learners and helping them to believe that they can achieve success;
- showing an appreciation for the learners' hard work, as hard work can produce positive results; and
- encouraging learners even though they may not see the results right away, but rather after the task is completed.

However, all the motivation and encouragement in the world will not ensure real progress in building self-confidence. Donald *et al.* (2002:130) believe that building a positive sense of confidence among learners should be one of the most important purposes of teaching in order to promote successful learning. Woolfolk (2010:408) recommends that educators may make use of the following processes to enhance academic self-confidence in Mathematics:

2.11.1. Reduce the pace

Start explaining new concepts and ideas at the learner's level of thinking and move on in smaller steps (Woolfolk 2010:408). According to Donaldson (2001) it is important to remember that not all learners learn at the same pace. High achievers may also be fast learners and tend to grasp concepts more quickly. However, it is important for educators not to get caught up in these learners' abilities to learn quickly, and speed up their

teaching pace to the disadvantage of learners learning at a slower pace (Donaldson, 2001). Educators should rather bear in mind that the rest of the learners need more time to understand and grasp certain concepts and ideas. If educators notice that these learners are not keeping up with the pace, they should reduce the pace in order to help these learners to also keep up and learn. By doing this, these learners will also feel more confident in their abilities to learn successfully.

2.11.2. Work on assessment

Ensure that all learners can at least do some of the work. This may require the educator to include easy questions in each assessment task. However, assessment should not be too easy. Consequently, educators will also need to include more difficult work gradually to challenge learners to work harder (Woolfolk 2010:408).

Educators should also encourage learners to do self-assessment by doing a SWOT (strengths, weaknesses, opportunities and threats) analysis. Manktelow and Carlson (2011) suggest that learners should consider their strengths, weaknesses, opportunities and threats in order to effectively build their self-confidence. When learners reflect on their achievement and failures it will help them to learn from it in the future. This in turn will help learners see opportunities and threats that may face them.

2.11.3. Clear and achievable learning outcomes

Break the work down into sub-outcomes to ensure that learners feel a sense of progress as they work through specific concepts. Ensure that there is a range of outcomes at different levels and that all learners understand them (Woolfolk 2010:408). Furner and

Burman (2004:6) point out that mathematical instruction that are reasonable and clear decrease the levels of anxiety learners may experience when doing Maths; therefore learners would be better prepared and will show more confidence in their ability to do Maths and subsequently experience success in Mathematics.

2.11.4. Never compare learners

Ensure that learners see the progress they make in their own work. Always point out to them how much they themselves have improved (Woolfolk 2010:408). MyChildHealth (2011) highlights the fact that each and every learner is intellectually different. Therefore parents and educators cannot expect every learner to achieve the same results. Learners should never be compared with one another, but should rather be encouraged to strive to do better than they themselves did before (MyChildHealth, 2011).

2.11.5. Communicate with the learner

Give specific feedback and help learners with corrections (Woolfolk 2010:409). More importantly educators also need to give feed-forward by ensuring that learners understand their mistakes and provide them with a goal to work for during the next assessment task. Huebner (2009:90) suggests that a learner's confidence can be enhanced when educators provide them with positive feedback, which needs to focus on the efforts made by the learner. This kind of feedback has to praise efforts made by the learner, as well as identify errors made and suggest methods and strategies to rectify these errors.

Huebner (2009:90) affirms that for educators to effectively provide such feedback they need to use formative assessment techniques. This may include one on one conversation, homework and quizzes in order to identify the learners' strengths and weaknesses in

Mathematics. According to Beckmann, Beckmann and Elliott (2008:278), feedback focusing on the wrong aspects can have a damaging and negative effect on learners' performances if they have low levels of self-confidence. During their study they found that learners who had low levels of self-confidence benefited from accurate feedback and it enhanced their performances.

In addition to feed-back and feed-forward, educators need to praise learners. However, praise should always be genuine and truthful. This will boost learners' belief in themselves as they realize that someone else notices their achievement (DeRoche, 2011). Christou *et al.* (2001:47) states that learners' self-confidence is greatly influenced by the praise they receive from their educators, parents and fellow learners.

Educators also need to listen to what the learners are thinking; they should take their ideas seriously and let them build on these ideas and prior knowledge (Brodie, 2006:13). Once learners notice that their ideas are taken into account, their self-confidence will also be improved.

2.11.6. Model good problem solving

Learners need to understand that the learning process will not always be easy and free of mistakes. Making mistakes is a huge part of learning. Therefore they should never become irritated with themselves or others when making a mistake (Woolfolk 2010:409). Good problem-solving skills will give the learners the ability to think about and reflect on their answers, and subsequently help in improving their academic self-confidence. Furner and Berman (2004:3) assert that educators need to accentuate the fact that there is nothing wrong with making mistakes. Consequently, learners should be encouraged to try and try again in order to develop good problem-solving skills.

According to UNISA (2011), good problem-solving skills can be acquired by following the seven-step cycle, namely:

1. Identifying the problem: By identifying the problem learners start thinking about possible solutions. If any uncertainty about the problem persists, learners may feel anxious and confused and this may lower their belief in their own abilities to solve the problem; therefore lowering their self-confidence.
2. Exploring the problem: Learners need to explore different solutions to the problem, since considering different options will increase the chances of finding an appropriate and effective solution.
3. Goal setting: Learners need to determine what they want to achieve by solving the problem, as this may help keep motivation high.
4. Brain-storm different solutions: The more possible solutions the learner can think of, the higher the likelihood of finding the successful solution.
5. Select the best possible solution: Learners need to consider all possible solutions and decide on one that will lead to a successful solution. This may be done by considering the outcomes of the solution.
6. Implementing the solution: Once the learners have decided on a solution, they should apply it to the problem. This step may take time and effort to complete.
7. Assess: Lastly learners need to assess their answer and determine the reasonableness and accuracy thereof.

2.12. General Conclusion

In this chapter it was asserted that self-confidence is the way learners judge themselves and their abilities in order for them to be successful learners. Filho (2009:95) affirmed that only a few

studies have been done to assess how learners' self-confidence changes and influences tasks at hand, as well as their ability to achieve academic success in their subjects at school. Studies showed that a variety of aspects could have an influence on academic self-confidence, which in turn influences learners' learning and their ability to achieve success in academics. Various techniques can be used to enhance learners' self-confidence in an attempt to enhance their academic performances and achievement. A need for further research is evident and in this research study the focus will specifically be on the learners' academic self-confidence and how it influences their ability to achieve success in Mathematics.

In the next chapter mathematical learning will be addressed