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FACULTY OF EDUCATION

DEPARTMENT OF APPLIED EDUCATION

**FACTORS LEADING TO NEGATIVE ATTITUDES TOWARDS
LEARNING OF MATHEMATICS AT SECONDARY SCHOOL IN KWEKWE
DISTRICT**

BY

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APPROVAL FORM

The undersigned certify that they have read and recommended to the Midlands State University for acceptance a dissertation entitled: factors affecting pupils performance during transition from primary to secondary school mathematics.

STUDENT: **DATE:**

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COORDINATOR: **DATE:**

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Abstract

The performance in mathematics by students has persistently been poor. Students' attitudes towards mathematics have been a factor that is known to influence students' achievement in mathematics. The purpose of this study is to investigate the factors contributing to negative attitudes towards mathematics resulting in poor performance at O'level and also establish the strategies that can be adopted to improve performance in mathematics by students in secondary schools in Kwekwe district in Midlands Province. The researcher used purposive sampling procedure in selecting the schools and the simple random selection was used for pupils. Data was collected through the use of questionnaires and interviews. The instruments were administered to [120] students, [12] secondary school teachers and [3] H.O.Ds for the schools used. Factors contributing to poor performance results from both teachers and students negative attitude, lack of motivation by teachers and the methods used for teaching. Parents' negative comments on mathematics have an effect in developing negative attitudes by pupils. The economic status of parents is also a contributory factor the school environment, influence of peers and adolescence all contribute in students' attitude towards mathematics. Improving these factors and sensitization of local community to discard practices which prohibit students' effective participation in learning maths could improve performance at O' level. It is anticipated that the findings of this study will give curriculum developers new insights in emerging issues on performance and influence the ministry of education on policy formulation. Students are also expected to benefit from the findings because improved mathematics performance will give them opportunity to pursue science related courses in higher institutions of learning.

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Dedication

I would like to dedicate this research project to my husband Mr. Wellington Mapingire to my lovely daughter Daisy and my son in law Archlove Matyatya together with my handsome grandson Nathaniel. Finally my dedication goes to my 4 lovely sons Tafadzwa, Tafara, Takudzwa and Totenda.

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CHAPTER 1

Factors leading to negative attitudes towards learning of mathematics at secondary school in Kwekwe district

1.1 Introduction

This chapter gave an overview of the back ground of the study, the statement of the problem is stated and research questions are given. The significance of the study, delimitations, limitations and definitions of the key terms are discussed.

1.2 Background to the study

Worldwide mathematics is seen as the base for scientific and technological knowledge that is important for socio economic development of nations. According to Amazingo (2002) the place of mathematics cannot be over stated because it is linked to the development of any nation. Goulding (2004) acknowledges that mathematics is useful in other disciplines and is one of the subjects used to select applicants for a particular career or course. Generally there is poor performance in mathematics at ordinary level. Many studies have indicated that the major cause is the negative attitudes which are formed during the course of learning. There are several factors that contribute towards the formation of these negative attitudes. Gates (2001) noted that mathematics pupils face with passion and determination but their daily experience of continued failure makes the majority of the pupils to be scared of mathematics. The feeling of fear and doubt in learning of mathematics creates negative attitudes.

Avocado (2000) ascertains that despite the relative importance of mathematics the learner performance in the subject has remained constantly poor. According to Freudenthal (2003) poor performance in mathematics has become a source of worry for many. Mathematics regardless of the fact that to be deemed having passed 'O' level to gain entrance to higher learning mathematics is a compulsory subject. One would expect that every student would strive to enjoy learning mathematics.

The government of Zimbabwe is encouraging learning of science subjects which include mathematics to be taken seriously. This is shown by the introduction of STEM (Science

Technology Engineering and Mathematics), education in Zimbabwe. This programme was launched by Professor Jonathan Moyo Minister of Higher and Tertiary Education, (Moyo 2016). This programme was designed to encourage students who took their ordinary level examinations in 2015 and passed with grade C or better to proceed to advanced level free of charge.

Attitudes affect performance of a person in everything in life. The link between attitudes and poor performance has been recorded in literature. According to Anthony and Walshaw (2009) mathematics plays an important role in moulding individuals with various skills of private, social and civil life. However the students' attitude affects their achievement in Mathematics. The factors that leads to negative attitudes have to be known so that we can interfere of manipulate these factors and change students' attitude for the better.

Obodo (2000) states that despite the relative importance of mathematics, it is disappointing to note that learners' performance in the subject in both internal and external examinations has remained constantly poor. A lot of students have negative attitudes towards mathematics hence perform badly at ordinary level. The research carried out by Greaber Michael (2014) in Ethiopia with reference to students' attitudes in learning mathematics, students perceived that mathematics classrooms do not seem to give them much exposure to the application of their real life situation. Pupils do not see the importance of mathematics as it is not related to their environment. Greaber and Weisman (1995) ascertain that mathematics helps the individuals to understand the environment and give accurate account of the physical phenomenon.

Negative attitudes that the students have makes it difficult for them to realise its importance and its relevance in life. According to Soyemi (1999) mathematics is a body of knowledge that opens up the mind to logical reasoning, analytical thinking and the ability for creative thinking. Wasiche (2006) ascertains that teachers may knowingly or unknowingly depict high achievers as the probable achievers in Mathematics examinations but low performers to be automatic failures in examinations and they show it openly. This may create a negative attitude towards the subject among low achievers, who may not learn the subject effectively. Furthermore performance in mathematics examinations may not be good if the learning of the subject was not sufficiently adequate. The low grades may be improved if learning of the subject was enhanced by ensuring that students had favourable attitudes towards the subject and towards the learning process itself.

Osafechinti (1990) observes that the learning of mathematics in schools represent first a basic preparation of adult life and secondly a gateway to a vast array of career choices. From the societal perspective, competence in mathematics is essential for the preparation of an informed citizen and for continuous production of highly skilled personnel required for industry, technology and science. The progress of any nation depends upon her scientific and technological advancement and can only be built on a sound mathematical education. Citizens have to be effectively functional in the natural and applied sciences. The study of mathematics therefore will go a long way to equip students to live effectively in our modern age of science and technology.

Nodding (1995) in his research findings posits that effective teachers facilitate learning by truly caring about their students' engagement and creating a conducive atmosphere for learning. According to Yara (2009) attitudes are formed as a result of some kind of learning experiences students go through. The learner draws from the teachers' disposition to form their own attitudes which may likely affect their learning outcomes. From his research findings Yara (2009) states that many students have developed negative attitudes towards the study of Mathematics as a result of mass failures in the subject.

However negative attitudes towards mathematics emanate from various factors. This researcher therefore saw it prudent to carry out an in-depth study to establish the factors that affect the development of negative attitudes in Mathematics among students in Kwekwe District.

1.3 Statement of the problem

Observations and reports from ZIMSEC revealed that a high percentage of Secondary students continue to perform poorly in Mathematics examinations. Despite the reports and comments given by the Board on performance in examinations students' performance in the subject is still low. In Kwekwe District the programme on Nastcep was introduced whereby selected students from different schools would gather at Kwekwe High School on Saturdays to have extra lessons with a combination of teachers from different schools as well. Yet in the face all these efforts the rate and degree of students performance still remains low for some of the schools in Kwekwe Urban area.

Hence now the question is what are the factors responsible for students' negative attitudes resulting in poor performance in Mathematics in secondary school education? The research will therefore take a survey of the factors responsible for these failures and effects on student and the future of our society. Consequently the promotion of favourable attitudes towards learning of mathematics is extremely critical and important.

1.4 Research Questions

1.4.1. What factors are affecting student's attitudes towards learning and performance in Mathematics?

1.4.2 How are these factors affecting students' learning?

1.4.3 What can be done to improve students' attitude towards Mathematics?

1.5 Significance of the study

It is important that a study of this nature is carried out to establish the extent to which negative attitudes affect the performance of the pupils. These findings will enlighten teachers, parents and the community at large on the effects of negative attitudes formed towards learning and performance in Mathematics by students. The recommendations may benefit the researcher herself, learners and the cluster schools will also be equipped with better perception towards the learning of Mathematics. The parents who pay fees will benefit together with the community at large as they realize the importance of Mathematics in the day to day life. Parents could be informed on building mathematical awareness within the home environment. It is hoped that the results of the findings may influence education planners and administrators to provide an enabling environment for learning of Mathematics. Curriculum planners and evaluators cannot be left out as beneficiaries since they are responsible for policy implementation.

The study will help the teacher selecting the best approaches or teaching methods which motivates and stimulates students to enjoy Mathematics. Finally this study was also seen as self – enrichment by the researcher because at the end of the study the researcher has acquired some insight into the field of research. The study will assist through workshops and seminars to staff develop the teachers with the main objective of improving the pass rate at ordinary level.

1.6 Delimitations of the Study

To carry out an effective study different environmental factors were taken into account. The research focused on one mine school, one high density school and one low density school. The three schools are in the Kwekwe urban district. Mathematics teachers, ordinary level pupils and Mathematics Heads of Department were involved in providing information needed for the study.

1.7 Limitations

The sample of the study concentrated on Kwekwe urban schools only, whilst the study demanded a more extensive geographical area. Schools in rural areas are the hardest hit by low pass rate but due to time and financial constraints the researcher only concentrated in schools in the urban area. Due to these constraints the researcher sampled schools which were reachable during working hours.

Some sampled respondent declined to cooperate in research citing lack of time and personal commitments. To encounter this problem the researcher had to dispatch questionnaires to respondents on time so that they attend to these in their own time. To ensure the research remain valid and reliable, the questionnaires used were framed appropriately with the supervisor's guidance.

Transport cost was incurred as the researcher moved from one school to another. Some expenses in typing, printing and photocopying of documents were also met.

1.8 Definition of Terms

The terms below are defined according to the context of the study.

Attitude:	Opinion or a way of thinking. General feeling towards a subject. In this study the term refers to the responses shown by pupils towards learning of Mathematics.
Performance	It is the classroom achievement done by students indicated through ordinary class work and tests.
Negative	Undesirable or an unfavourable attitude

Anxiety

Feeling of fear and doubt about the future teaching and learning of Mathematics

1.9 Summary

The chapter outlines the background of the study highlighting a justification to carry out the study. The statement of the problem, significance of the study and research questions were given. Operational definitions of terms were outlined to avoid different interpretations by readers. Delimitations of the study were done in Kwekwe District, mathematics teachers and students being the population under study and limitations to the study were discussed.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

The chapter reviewed literature related to the study on negative attitudes towards learning and performance in mathematics among secondary school students. There are several factors that lead to negative attitudes towards mathematics at secondary schools. These negative attitudes are attributed by students, the family, structure of the school and the teachers through their own delivery methods. The social backgrounds of the parents and the adolescent stage also contribute to negative attitudes of the students towards learning resulting in poor performance in mathematics.

2.1 Definition of Attitude:

Attitudes are concerned with an individual way of thinking, acting and behaving. Attitudes can be positive or negative. Negative attitudes have serious implications on the learner, the teacher as well as the social group with which the student relates, while positive attitude improves student achievement. Student attitude can be boosted and improved through the use of a variety of strategies. Child centred methods and group discussions, provision of relative books and resources boost the morale of students. Cohen, (2003) defined attitude as a result of several beliefs a person holds that makes them respond in a certain way towards a situation. Zan, (2002) defined attitude as a state of readiness, a tendency to act or react in a certain manner when confronted with certain situation. With reference to learning Wasiche (2006) defines attitudes as a feeling towards something or somebody which is sometimes shown in a person's behaviour through learning experience if an individual create attitudes. Attitudes are further enhanced by interpersonal interaction. Njue (2005), ascertains that attitude is either positive or negative depending on whether a person likes or dislikes something or someone. Attitude towards mathematics plays an important role in teaching and learning of mathematics. Attitude affects people's achievement in mathematics. There are several factors that lead to negative attitudes towards learning of mathematics at secondary level. These negative attitudes are attributed by students themselves, the family, structure of the school and the teacher through their own

delivery methods. According to Farooq (2008) the way mathematics is presented in the classroom and observed by students even when teachers believe they are presenting it in accurate and context dependent way stands to distant many students from mathematics. Hence the methods used should be able to cater for students with different abilities.

Daskalogianni,(2000;p218) defines attitudes towards mathematics as an accumulated measure of, “a liking or disliking of mathematics a tendency to engage in or avoid mathematical activities a belief that one is good or bad at mathematics is useful or useless.” Similarly Di & Zan, (2003) consider attitudes towards mathematics as a more difficult occurrence characterised by the emotions that one associates with mathematics and how they behave towards mathematics. Attitudes towards mathematics include the tendency to be fearful of and anxious about it. Furthermore Polo & Zan (2006) believe that most people think that mathematics is just algebraic formulae or perhaps the geometry that they are taught in classroom but mathematics involves a lot of concepts that are of relevance in our everyday lives. Failure to link mathematics and other disciplines makes it difficult to pupils. Attitude as a concept is concerned with an individual way of thinking, acting and behaving. Shun (2004) defines an attitude towards mathematics as a personality aspect of mathematics that has been acquired by an individual through their belief and experience but which could be changed. Attitude is formed as some kind of learning experience, they may also be learned by following the example or opinion of a parent, teacher or friend. The learner draws from their teacher’s personality to form their own attitudes which may likely affect their learning outcomes.

2.2 In School Based Factors

2.2.1 Availability of teaching resources and methods of teaching mathematics

Adebjei and Owoeye (2002) found an important relationship between the use of recommended textbooks and academic performance. According to Douglas and Krishin (2002) in a broad review of activity based learning in maths in kindergarten through grade eight concluded that using calculating materials produces greater achievement than not using them. They also noted that the long term use of concert instructional materials by teacher’s knowledgeable in their use improves student’s achievement and attitudes. Ankomoh (2008) noted that effective teaching and learning greatly lived on the competences of its human resources as well as material resources

which are needed for the integration of knowledge. According to Psacharopolous and Wood Hall (2005) test books are a major input in performance in examinations. This view is shared by Chepching (2005) who observed that availability of quality text books in secondary schools is strongly related to achievement among children from lower income families especially in public schools. According to Munda et al (2000) physical facilities contribute positively to students' academic performance.

The teaching methods used to impart knowledge are very important in motivating students understanding of mathematical contents. Discussion, project and discovery methods create an enabling environment for the learners and ensure that the individual differences are taken care of. These methods are child centred. According to Costello (2001) lecture method is ineffective in that it turns the learners into passive participants in the learning process. However despite the disadvantage, lecture method is useful in covering large content (SMASSE, 2007). Teaching and learning materials for mathematics questions on uses of text books, geometrical sets calculators coloured chalks, charts and models enhances learning. Lack of use of these teaching aids demotivates the students.

Another research finding suggested that students often have very different perception of how a mathematics class should be conducted (Diamond, 2001). Teachers often followed a text book to fill the allotted time for mathematical computations via pencil and paper practice alone. This practice tends to leave little opportunity for creative problem solving and mathematical interpretation. The mathematics taught in many schools therefore appeared to student as only a creation of teacher's and text book writers as opposed to essential life skills (Diamond, 2001). Unfortunately students who objected to the format or a goal of a mathematics class could either argue convincingly for different approach or simply trust the teacher and wait for results (Diamond 2001). Without doubt the teacher maintained a potent force in the classroom. From research it was also found that a teacher's enthusiasm towards the subject matter had a greater impact on the student's attitude than instructional variables. A teacher who showed excitement towards mathematics for example tends to produce similar enthusiasm to their student. Furthermore a teacher who disliked and feared mathematics also passed on a lasting negative attitude to students (Burton, 2000).

2.2.2 School Environment

The school that one attends is the institutional environment that sets the parameters of a student learning experience. Students' academic success is influenced greatly by the type of school they attend. School factors include the structure, school composition and school climate. Schools are accountable for student's performance. Depending on the school environment schools can either open or close the doors that lead to academic performance Barrg (2005). According to Crosnoe et al. (2004) the school sector (public or private) and class size are two important structural components of the school. Private schools tend to have both better funding and smaller sizes of class than public schools. Overcrowded classrooms make it virtually impossible to carry out the kind of individualised and performance oriented instruction essential to meet the standards. In many schools teachers are typically assigned to classrooms with forty-five and above learners. However this affects teacher's potential negatively in the sense that they will not be able to attend pupil's weaknesses one by one. In such settings chances for meaningful instruction between teacher and student are slim and opportunities for good teaching and learning are severely compromised Crosnoe et al (2004).

According to Eamon (2005) the additional funding for private schools leads to better academic performance and more access to resources such as computers which have been shown to enhance academic achievements. Libraries are important in the academic performance of learners in schools. Williams et al (2001) explain that libraries play a crucial role in providing enrichment to students from disadvantaged backgrounds by providing additional help to develop skills to succeed. However some schools do not have libraries and if the libraries are there, there are limited resources. With this, learners are left with no option rather than depend on restricted textbooks as well as their teachers who sometimes do not use teaching methods that are palatable to students which eventually stimulate negative attitudes toward mathematics. With the acute shortage of qualified mathematics teachers most of the students are taught by unqualified teachers resulting in poor performance. According to Balli and Alvarez (2003) students who attend schools with higher number of teachers with full credential tend to perform better and vice-versa. Sugahara (2008) postulates that learner's backgrounds relating to the availability of educational resource at home such as books, electronic resources such as computers, calculators study desks and chairs as well as a conducive study environment and general academic support from home are important when it comes to pupil's success academic wise. Students who have

access to such resources are at an advantage compared to those from poor families for the reason that they will be more informed about the most update developments around them thus supplement their learning at school.

2.3 Teacher's attitudes towards mathematics

Teachers also need to give positive messages to students at all times. The environment created by teachers at early stages of secondary education is very important. Students are moving from primary school where they were being taught by one teacher in all subjects but as they get to form one there is a change. The teacher has to lay a good foundation so as to create a strong base for the subject. In their research Beilock et al (2009) found out that the level of anxiety held by woman elementary teachers also predicted the achievement of the girls in their classes but not boys. They further illustrated that girls look up to their female teachers and identify with them at the same time teachers are often and sadly carrying the idea that maths is hard for them or they are just not a 'math person'. Many teachers try to be comforting and sympathetic about mathematics telling girls not to worry, that they can do well in other subjects, as a result a negative attitude is created among the students. Teachers and parents need to replace sympathetic messages such as, "don't worry, math is not your thing" with positive messages such as, "you can do this, I believe in you, math is an open beautiful subject that is all about effort and hard work."Boaler (2015)

Attitudes as a concept are concerned with individual's way of thinking, acting and behaving. Attitudes have very serious implications for learner, the teacher and immediate social group with which the individual learner relates and the entire school system. Attitudes are formed as a result of some learning experiences students go through. In this respect the learner draw from their teacher's character to form their own attitudes, which may affect their learning out comes Yara, (2009). According to Yara, (2009) teachers with positive attitudes towards mathematics were motivated to inspire favourable attitudes in their students and vice versa. This immediately puts the teacher in spot light as one whose attitude, expressed in their behaviour has a telling effect on students. Teachers attitude towards mathematics has a major role in shaping classroom practices Bolhuis & Voeten (2004). People also learn attitudes through observation of people around them, especially if they are people they admire, respect or hold in high esteem. Children therefore

invariably observe the attitudes of parents and teachers and learn a lot from them. Teachers are regularly role models whose behaviours are easily copied by students.

2.4 Motivation of teachers

A highly motivated teacher puts in the maximised effort in their job. According to Larrant (2008 ,p69), “today relationship between teachers and pupils is often up-side down, pupils go to school because they must and teachers teach because they are paid to.” Teachers mourn that their profession is not respected and complain that they are inadequately paid for their duties they are required to do. They look over their shoulders at other professions and condition of service for a better life, this assertion by Farrant (2008) exhibited lack of motivation on the part of both teachers and students. More so it may contribute to ineffectiveness and inefficiency in academic work and its effects are poor performance. Studies by Lockleed (2001) cited in Etsey (2005) revealed that lack of motivation and professional commitment produce poor attendance and unprofessional attributes towards students which in turn affect their performance academically.

Bandura (2003) in Olegede (2006) through his theory of social learning implies that the teacher should demonstrate their own enthusiasm in mathematics learning so as to model a desirable behaviour to students, if the teacher looks bored according to this theory so will the students. This means that the teacher has a big responsibility as the imitation that can go beyond the classroom to the students own career. Hence it is important to use positive verbal remarks in the classroom as well as varying approaches in solving problems. However this can only be possible if the teacher has a psychological background in his teaching qualifications which would equip them with the correct methods of teaching. Only a few people go for a degree in mathematics and those only do the service for a short time and go for greener pastures. As result there is an acute shortage of mathematics qualified teachers. In Zimbabwe a number of mathematics graduates join the teaching service just for a short period, and then look for greener pastures. Students are left without qualified teachers resulting in poor performance at O’ Level. A’ level students are employed to teach maths to alleviate the shortage. Those mathematics teachers who are available are overloaded with work resulting in low morale as some of them are given exam classes. These teachers work extremely hard to see students through and non-examination classes are given to unqualified teachers. However there was an observation made by the findings by the Ministry of Education through the curriculum development unit (1993) who discovered that most

teachers had ordinary level as their highest academic qualification and a certificate in education as their highest professional qualification, teachers need to upgrade themselves.

Besides lack of motivation through pay, one finding was that the teachers never learned the subject properly all the way from kindergarten through college Sweeney (2008). Teachers performed badly due to lack of innovation. The teacher centred methods are used instead of child centred methods. The only methods used are exposition and lecture methods resulting in students knowing the procedure and that demotivates them. This is because such teachers lack theoretical background that can assist them in motivating, reinforcing and giving feedback to students among other factors that would enhance their positive self-esteem. According to Galabawa, (2001) the teacher is the heart of classroom instruction and their effectiveness depends on their competence that is academically and pedagogically. In addition the teacher needs efficiency which can be seen through their ability to tackle different mathematical concepts with confidence, handle his work load without succumbing to pressure and commitment to duty. However this can only be possible if the teacher has support in terms of teaching and learning resources from education managers and supervisors.

Mosha, (2004) has observed that mathematics is a skill that is difficult to acquire and because the teaching profession does not pay well, there is a shortage of qualified mathematics teachers in the subject. As a result some personal and environmental factors can influence causal beliefs which in turn influence related behaviours. For a teacher to understand the attribution theory and be able to use it to change negative mathematical attitudes of students and they own, must possess a professional qualification in the teaching of mathematics and be in possession of knowledge in education psychology which is the foundation needed for one to be an effective teacher in the subject.

2.4.1 Teachers qualifications and teaching of mathematics.

Mathematics is an art which needs to be learnt in order to be understood hence it needs to be taught by a teacher with a sound knowledge of the subject matter. Chivore (2007) concurs by saying that teaching is about how to put across what one knows to the learner. Consequently, if a teacher lacks content knowledge he cannot teach effectively resulting in poor performance among learners. The assumption here is if a student comes from a sound mathematical

background and is not dull then a teacher should examine the school for the source of the student's negative view of one's poor performance. Failure has also been attributed to the society, such as the instability of educational policies, under-funding of the educational sector since these views are either internal or external the consequence is that the learner can control some causes while others are beyond their control. This hinges on the study because perceptions form an individual's belief system, which will in turn guide their level of commitment in mathematics Salami, (2007).

2.4.2 Students attitude towards mathematics

According to Cohen, (2003) the learning of mathematics is affected by the self-reliance of learners in their mathematical abilities and the attitudes, beliefs and feelings they harbour towards mathematics. Kondo, (2005) noted that children begin schooling with rather positive attitudes however these become less positive as children grow up and they frequently become negative at high school. Hoyles (2002) found that 14 year old students tend to associate their mathematics experience with feeling of anxiety and failure. When a student has repeated failures in maths it could be in class exercise or test a student might feel that maths is difficult hence they cannot do it. A negative attitude develops and they concentrate on other subjects. Frank and Lester (2007) said the negative attitudes and the dislikes of learning mathematics as being caused by a confusion of what and when to do with formulae so as to understand and how to write down the answers. They also highlighted three causes of negative attitudes as

1. Students find themselves in the problem for when to and which formula to apply for a correct answer to be attained.
2. If students score low marks two consecutive times their moral reduces.
3. Scared students have either low or no interests in mathematics.

Twoli (2006) ascertains that repeated low achievements in mathematics examinations may lead to unfavourable attitude towards mathematics learning. Mathematics can be taken to be a hub and other subjects are spokes. Pupils should be able to recognise the use of mathematics in other subjects. Taking for instance food and nutrition the proportions that they measure when cooking, in accounts and business studies their calculations in loss and profits, these are only but a few

examples in the use of everyday mathematics in our daily lives. Most students fail to link mathematics with other subjects, hence they fail to appreciate its richness and value. Students also develop a negative attitude towards mathematics due to language that is used, the symbols, notations and formulae. Most students fail to understand which formulae to use to get to the correct answer. If pupils have a less understanding of the language in mathematics they tend to view it as a very difficult subject to handle. Preparing students for ordinary level exams is important but unless students understand how to apply mathematics skills they will not always be able to use these skills, in their future lives. O Leary (2010) also viewed mathematics as a subject that is lacking any kind of inspiration or sense of personal suggestion about the future. Apart from this they believe that mathematics is abstract it does not require clear thinking. Borasi (2000), Shoenfield (2005) state that the concepts students hold about maths determine how they approach the subject. In many cases they approach maths as procedural rule oriented. This prevents them from experiencing the richness of maths and many approaches that can be used to develop a positive attitude towards the subject.

2.5 Factors Reinforcing Negative Attitude

2.5.1out of School Based Factors.

2.5.2 Heredity

According to Paul Ernest, (1989) the Old Humanists view of mathematical ability, mathematical talent and genius are inherited. Mathematical ability can be identified with pure intelligence. The view of these old Humanists is that since the mathematical ability is inherited the teacher is just there to just facilitate that the student has to realise the potential. This view is as aired by the technological pragmatist who believes mathematical ability is inherited and requires teaching to realize its potential. According to Olatonde, (2009) states that although children have particular talents for various topic a teacher can make all the difference between a pupil losing interest(which is exceedingly difficult to recover in mathematics) or working thoroughly enjoying the subject. If a teacher loses pupils interest negative attitudes are formed and are difficult to reverse. Farooq (2008) defines intelligence as abstract reasoning ability. It is the ability to discover the rules, patterns and logical principles underlying objects and events and the

ability to apply these discoveries to solve problems. Haralambos (2013) argues that intelligence is due to both genetic and environmental factors. It stems partly from the genes individuals inherit from their parents and partly from the environment in which they grow up and live. Environmental influences include everything from diet to social class from quality of housing and also family size. The progressive educator theory of mathematical ability is individualistic. Its central assumption is that there are innate differences in mathematical ability leading to differential individual rates of development. However, according to Saunders (2001), each individual mathematical ability need an appropriate set of experiences to be fully realized otherwise the child growth maybe numbed. The progressive educator believes that there are two contradictory forces that are at work deriving from rationalist and empiricist epistemology. There is the pool of inherited ability and the innate stage of thinking as well as the impact of experiences and the environment. As shall be shown further not only one factor contributes to the negative attitudes but several factors come to play.

Finally the public educator ideology of mathematical ability is viewed largely as a social construction with the impact of the social context having a major role in individual development, and in particular on the manifestation of ability. Individuals are understood, according to this perspective to be far more comparable in characteristics and abilities at birth than after years of socialisation in varying environments. Thus abilities are conferred on students by their experiences and by the way that they are perceived and labelled by others (Wayne & Young 2000). They believe that mathematics ability is not innate but there are other factors acquired in life that are forced on the basis of certain indication. These scholars are not completely dismissing the genetic factors but they argue that other pertinent factors come into play. Their research indicates that males excelled in spatial ability whilst females excelled in verbal ability. These differences may dispose the students to view mathematics learning differently. Ying et al (1991) ascertains the difference in ability may not necessarily be genetic but could be due to other factors.

2.5.3 Parents Attitude

Acelajdo (2004) asserts that there is a substantial influence of parents on their children's educational ambitions and it is much stronger than that of peers. Studies have shown that parents who are knowledgeable, aware and more involved with their responsibilities bring up their

children having a more positive school attitude and a better academic performances .According to Anthony & Walshaw, (2007), comments given by parents affect the students especially if the parent is not able to help the child with homework and they air their sentiments that the stuff is difficult and it makes them nervous. Students pick up on these messages and it affects their success. Most parents who were not good with maths find it difficult to help their children with homework. From their research Cates & Rhymer (2003) found that when mothers told their daughters that they were not good at math in school their daughter’s achievement declined almost immediately. They further echoed that it was not maths knowledge that harmed the student performance but the parents anxiety. Most parents communicate negative messages which are harmful such as “maths is hard” or “I was never good at maths in school”. It is important that parents interact with children about maths communicate positive messages saying that maths is exciting and it is an open subject that one can learn with hard work.

The family plays a role in developing a negative attitude especially if no one in the family has done well in the subject. Civil (2003) illustrated that the social interactions with the family and society tend to prepare the child to dislike mathematics through assigning time and again a variety of negative statements like mathematics is difficult and hard to learn. Some parents even go further to say its ok to be bad at mathematics because it is a difficult subject. According to M. Chun and Fun (2001) involvement of parents has a direct impact on student academic achievements. Furthermore Parsons et al, (2000) echoed that children attitude towards mathematics is affected by their home environment. The home environment comprises of various motivational variables but the most relevant one involves the parents. Furthermore, Balli and Alvarez (2003) argues that mathematical self-concept can be strongly influenced by primary school experiences and the attitudes of parents with traumatic early mathematics learning experiences being capable of exerting a long term effect leading to lack of motivation. Mathematics achievement is affected by children’s attributes and behaviour which is primarily influenced by parental involvement. From other studies it was also noted that divorces affected the student education. A sample study of 699 elementary students was conducted by the Kent State University (2003) and it was discovered that children from divorced homes perform worse in reading, spelling, and math. The researchers concluded that children and young adolescents suffered long term negative effects following divorce. Parental absence was essential to cognitive test scores for young children as noted by Frank Mott, (2005) and parental presence

influence girl performance in math. Teenagers who experience parental divorce score low than their counter parts from intact families on math, science and history test. According to Youngmin et al (2009) lack of family transitions after divorce does not eliminate effect of divorce on student academic performance but it does provide their performance in math and social studies a certain degree of protection compared to students who live in unstable families with multiple family transitions behavioural, emotional and moving tendencies increase problems for adolescents. From these researches it can be seen that some of the parent behaviour leads to the downfall of student performance at high school. Divorce affect student tremendously, socially and economically. Hence student concentration decreases as a result this will lead to negative attitude in mathematics because the student will not be able to concentrate and successive failure will lead to negative attitudes.

2.6 Social Economic Status

Social economic status is mostly determined by combining parents, educational level, occupational status and income Jeynes, (2002). In most of the studies done in academic performance of students, it is not surprising that social economic status is one of the major factors studied while predicting academic performances. According to Graetz (1995) ones educational success depends very strongly on the social economic status of the parents. Considine and Zappala, (2002) argue that families where the parents are advantaged socially, educationally and economically foster a high level of achievement in their children. Theresa and Michael (1995) list the barriers of learning that can result from low income. Low income means insufficient funds to pay fees, buy uniforms, pay for school trips, no provision of transport, classroom material, school textbooks to mention just a few. This can lead children to be isolated, bullied and stigmatised. Children from low income families are more likely to suffer from ill health which can affect their attendance and performance at school.

Low income parents cannot afford private tuition or access to private education for their children. Low income reduces the likelihood of a computer at home with internet access, a desk, educational toys, books and space to do homework and also a comfortable well heated home. All these factors lead to poor performance and the majority of students from low income background go to school without eating and some even have one meal a day. Mathematics is a subject which needs a lot of concentration hence students can hardly learn with empty stomachs. Lack of

concentration leads to negative attitudes because students are lost along the way and at times it becomes difficult for them to catch up. In addition some students stay far away from school and they have to walk long distances to get to school, and reach school very tired and usually very late for lessons. Furthermore children from poor back ground might experience absenteeism due to distance from the school especially during the rainy season. Without transport and flooded rivers students might fail to reach school. All these factors may lead to negative attitudes in mathematics resulting to poor performance at O level since it is a compulsory subject.

2.7 Gender on Negative Attitudes in Mathematics

Spencer, Steele and Quinn (1999) have shown that women unlike men are frequently faced with negative stereotype regarding their mathematical abilities and that these stereotype can impair performance. Despite the similarity in mathematical abilities between males and females research consistently indicates a pervasive implicitly perception that math and sciences are masculine domains (Nosek, Banaji and Greenwald 2002 and 2006). These attitudes and stereotype are fostered in girls and boys throughout their lives, passed on perhaps unconsciously by parents (Parsons, Adler and Kaczala 2000) teachers Gerraty, (2001), Jussin & Eccles 2002) and the media Wilgosh (2001). Societal stereotypes are prevalent and difficult to avoid and research indicates that girls are influenced by stereotypes about their gender and math at a fairly early stage in their education (Steele, 2003). Awareness of the stereotype leaves girls vulnerable to stereotype threat meaning that simple knowing that one's group is expected to perform less well in a domain will increase the likelihood of poorer performance Espencer et al (1999) Steele and Aronson, (1995).Furthermore Mcrae, (2003) ascertains that mathematics anxiety is more closely associated with females than males.

Despite the unsettling reality of the negative effects of stereotype threat, recent studies have suggested that it can be reduced through various inventions (Cohen, et al 2007) such as by protecting women's math performance through the presence of female role models in mathematics domain Marv and Roman, (2002). Additional, studies have shown that being in the presence of a female role model can lead to women having higher career aspirations Nautu et al (1998). Having such a role model in the classroom can change academic attitudes Inzlicht and Ben-zeev (2000) noted in their research that girls performed better in mathematics in a single-sex learning environment. Students education environment are by no means the sole influence on

girls academic performance. Furthermore a girl child might experience gender stereotype whereby when there is no money boys are preferred to attend school than girls. If there are household chores to attend girls might miss school to attend those. However missing one or two lessons in mathematics is like being lost in the jungle and might be difficult to find the way back home. These are some of the factors which contribute in developing negative attitudes towards mathematics and students learn it without interest because they have to do it.

2.7.1 Community

Anxiety is experienced when a student highly values a task but feels that they have no control and it is the incongruence of these things which cause discomfort (Crosnoe et al 2004). Since we know that many in the community experience mathematics anxiety, it follows that environmental factors are likely to contribute. Firstly to people valuing math and secondly to how much control they feel in relation to the subject. We could think of high value being reflected in the idea that ability in maths and general intelligence are linked. Mathematics is valued because it is considered an indicator of intelligence and therefore showing poor mathematical ability has implications for how smart you will be perceived to be (Fisher and Richards 2008). Feeling of lack of control could stem from the idea that maths is difficult or that you have a maths brain in order to succeed in the subject. These two types of myths fuel the experience of maths anxiety from students and the community.

In addition to these ideas other beliefs also promote a negative culture around maths. Perhaps one of the reasons that maths anxiety is such a common feeling in the community is that it is acceptable to show anxiety in maths. Even though the link in maths or worry over maths is socially acceptable and is considered the norm. On the other hand if a student admits that they like maths and they are good at it, that student will often be labelled a 'nerd'. This contradiction reflects culture that facilitates the development of maths anxiety in students. Negative community beliefs about maths are often heavily endorsed in adolescence through high school peer culture. Indeed the high school classroom seems to be one of the places where negative attitudes towards mathematics are most prevalent. While adolescence in general is a developmental stage associated with decline in academic motivation. Gottfried et al (2007) mathematics seems to be the subject that is hardest hit. Researchers in the US found that maths anxiety increased most sharply in early adolescence particularly in the early years of high school

Macreque (2003). Findings from 2003 Program for International Student Assessment (PISA) demonstrated that anxiety and negative attitudes are also more typically reported by girls in adolescence. Some societies believe maths is only required by those students who choose to follow scientific career, maths is only for bright kids and societal and peer pressure prevent girls admitting they like and enjoy maths, whatever the level of difficulty of the study. The latter myth relates to a phenomenon known as stereotype threat which has been widely researched in order to understand girls' higher levels of maths anxiety poor achievements and lower representation in mathematics related carrier (Thomasetto et al 2011). In application this theory suggests that girls are exposed to negative stereotypes about gender and maths and threat of the stereotype makes them more vulnerable to feeling anxious.

Myths in relation to gender and maths are not the only ones that have the potential to negatively impact students learning in maths. There is a common misconception that maths is only important for people with carrier interest in fields like engineering, business and science when in fact it is a subject that provides thinking skills valuable to everyday life. Teachers have the opportunity to dispel negative stereotypes and myths about maths and to help to create a positive classroom environment that encourages students to have a goal without fear. In order to do these students should feel that maths is just like any other subject and hard work will bring about improvement? Teachers also have the opportunity to encourage their students to believe that things like stereotypes and negative peer culture should not limit their mathematical choices. Students should also be made aware of the many applications of maths in carriers and life pathways. Armed with this outlook they will be able to fulfil their maths potential and make choice based on factors other than anxiety.

The challenges that students face in schools cannot be solved by educators alone nor can these problems be solved by parents or families alone. Students in schools across this nation are confronted by critical social emotional and environmental problems. More collaborations between the school and home will need to be focused on dealing with this problem Drake (2000). Schools that recognise the interdependence nature of the relationship between families and school and value parents as essential partners in the education process will realise the full value of this collaboration. Such an approach recognises the significance of family and the

contribution of schools as a necessary frame work for working to complementary efforts towards common goals to maximise success for students as learners (Christenson and Sheridan (2001)

2.7.2 Adolescent stage

At primary level the student observe themselves the same as boys and girls, but as they grow they see changes, the body features develop. That is when the student start to realise that there is a difference between being a girl and being a boy. There is more attraction to opposite sex and this causes some disturbances on the level of concentration. Attention is now diverted from learning and students might spend more time worrying about their appearance especially girls. With diverse attention and mathematics becoming more demanding some students lose track and hence consecutive failures follow and then the negative attitude towards the subject follow. At this stage again pupils might view their teachers differently, especially girls towards male teachers. Some might work to interest the teacher. The adolescent stage is filled with many psychological changes. As noted by Wigfield et al, (2006) adolescent experience rapid maturation changes, shifting societal demands, conflicting roles demand, increasingly complex social relations and new educational expectations. This is a very difficult stage for most students and educational demands will need more attention. At this stage that is where one realises that most pupils who passed grade 7 with flying colours tend to fail their O level. At this stage teachers need to be mentors of their students such that the relationship in the learning environment is more friendly and encouraging to learning because attitudes fluctuate due to adolescence challenges.

Fisher and Richards (2008) echoed that pupils developed negative attitudes where students perceived their leaders as admonishing and enforcing strict behaviour. Furthermore Mcleod (2002) echoed that attitudes tend to become more negative as pupils move from elementary to secondary school. At elementary stage students are used to being taught by one teacher so as they move to secondary school they change classes and they are now taught by different teachers. Teachers do not spend more time with these students as a result the relationship that a teacher creates at the beginning is going to affect how the student perceive that subject. At this stage mathematics teachers need to exercise more caution and use more interesting and motivating methods of teaching which are child centred because the math language used has to be grasped at this stage. The teacher should be able to move from the known to the unknown.

Avoid having too much assumed knowledge but help the student to move from what they know to the unknown. Mcleod (2002) said that positive attitude toward mathematics is related to mathematics performance in the classroom. Van Wagner (2008) ascertains that attitude at the beginning of a difficult task determines the success or failure of the outcome. In his research Hannula (2002) established that attitude is fairly stable and can only be affected by minor changes based on success and failures. It is at this stage where mathematics teachers have a great impact on shaping the students attitude. Anderson (2007) concurs that teachers can reinforce the idea that mathematics is an interesting subject like other disciplines and that for one to further their studies it is a requirement to have O'level mathematics.

2.7.3 Peer Pressure

As students interact with each other in secondary schools they influence each other with regards to their perception of mathematics. According to Costello (2001) peers may influence others that mathematics is unfeminine. There is a lot of peer pressure and distraction. At this stage of learning, image issue is so pertinent that a student will not wish to be different from their peer group. This could lead to formation of attitudes which are also stereo typed slogan 'bright girls fear success' or 'nice girls do not do mathematics' Costello (2001). It is at this stage that most girls develop a negative attitude towards mathematics. Many think that it is a masculine subject. Whenever attitudes are formed especially negative attitude girls are usually the ones who are on the receiving end. Research by Kaino (2008) in Botswana found out that girls had more negative attitude than boys. He also found out that girls feel harassed by boys when they do not answer questions correctly in class. This mainly affected mixed classes that they feel shy when with the opposite sex learning mathematics together. Boys on the other hand indicated that they cannot concentrate while sitting next to girls, worse still they claim girls make noise Kaino, (2008).

In most cases you will realise that the sitting positions of students in class is according to gender. Choosing friends at this stage is very important for students. Some are slow learners and some are fast learners. It is important to choose friends who are most gifted so that they boost the level of understanding the subject matter. However some students might end up developing negative attitudes when they realise that they are not gifted and most of the time they get wrong answers. In her research Tobias (2003) also observed that when a child is not gifted or a slow learner they might end up being afraid of their fellow students from discovering their

weaknesses. Subsequently such fears will lead pupils to become puzzled and as well be unable to seek help from other pupils or teachers as a result they are not able to overcome the abstract to mathematics hence they develop a negative attitude. McNub and Cummaine (2006) observed that students fail to learn mathematics because of their attitude and perceptions of mathematics and their fears and anxiety towards the subject. Frank and Lester (2007) stressed that the cause for the students anxiety to mathematics include an emphasis on the right answers and the right method. Fear of making mistakes, insufficient time, word problem and problem solving. This can be likened to stage fright which can lead to a hindrance, triggered humiliation resentment and panic in pupils.

Pupils tend to develop a negative attitude and they show no interest at all for the subject. Tobias (2003) emphasised that mathematics anxiety causes children to have a negative attitude towards the subject. Hence this negative attitude hinders children ability to take mathematics as a relevant part of their everyday life

Student attitude towards mathematics influences the efforts they put in understanding and practicing mathematical concepts and skills. According to the National Research Council (2000) as cited in Akey, (2006) student belief about their competence and their expectations for success in school have been directly linked to their levels of engagement as well as emotional states that promote or interfere with their ability to be academically successful. Thus attitude determines the efforts a student is likely to put in his learning of the subject mathematics. It is therefore necessary for mathematics teachers to strive and sustain positive attitudes towards mathematics for good performance in upper classes (Benson 2009).

In an attempt to find out why students disliked mathematics, Quilter & Harper (2003) discovered that many students have negative attitudes towards mathematics because of how it is taught and also that there is a perception that mathematics teachers present O' Level mathematics as being difficult and only accessible to the select few. Furthermore a student can attribute poor performance to the family's poor performance in the subject .This kind of attribution might be difficult to change because the student has no role models at home to encourage them in the subject. Some personal and environmental factors can influence the student's attitudes towards mathematics.

2.8 Summary

This chapter presented a review related to the investigation on several factors that contribute to negative attitudes towards mathematics resulting to low pass rate at ordinary level. The most prevailing factors that seem to contribute much on negative attitudes towards mathematics socio-economic factors which involves the education of parents and behaviour and economic status. The student's attitudes, adolescence stage, peer pressure and students motivation are some of the factors which contribute to negative attitudes. School based factors involved school type and teacher characteristics which involved teaching methods, teaching aids, teacher qualification and motivation. The next chapter will look at the research methodology used by the researcher to gather data relating to the study.

CHAPTER 3

Research Methodology

3.0 Introduction

This chapter outlines the procedures and strategies that were used to collect and analyse data. It focuses on research design, target population, sampling techniques and sample size. Description of research instruments and an outline of methods and techniques that were used to collect, analyse and present data.

3.1 Research Design

Bless and Higson (1995) define research design as a programme that guides a researcher in collecting data, analysing and interpreting observed facts. It is a detailed plan that indicates all steps on how the scientific inquiry into the research problem will be conducted. Therefore research design is a guideline within which a choice about data collection methods has to be made. In this study the descriptive survey method was used as the research design, to find out the factors that reinforce negative attitudes towards learning and performance in Mathematics.

According to Creswel (2005) the research design is a master plan specifying the methods and procedures for collecting and analysing data. The descriptive survey often uses visual aids such as graphs and charts to aid the reader in understanding the data distributions. It is often difficult to understand large amounts of data hence descriptive statistics are very important in reducing the data to manageable form.

Best and Kahn (2007) alluded the fact that descriptive research is devoted to the gathering of information about prevailing conditions for the purpose of description and interpretation. Thus the survey research employs application of scientific method by critically analyzing and examining the source materials by evaluating data and also by arriving at generalization and prediction.

Advice on how to structure the instruments and carry out the data collection was from the supervisor and related literature. Also to ensure that the respondents were free to provide information, the researcher pointed out clearly to them that no remark of their identities will be

disclosed and results obtained will only be used for the purpose of the study. The descriptive survey was chosen because it allows the researcher to obtain a complete and accurate description of a situation as propounded by Luturner (2002). The researcher needed to obtain accurate and complete data on student's attitude towards mathematics and how these attitudes affected their learning resulting in poor performance at ordinary level.

3.2 The Target Population

A target population is the entire group of individuals or objects to which the researchers are interested in, with similar characteristics. According to McMillan (2006: 194) "a population is defined as a group of elements or individuals, objects or events that confirm to specific criteria and to which we intend to generalize the results of the research". Cresswell (2005) refers to population as all the individuals with objects or events that will be considered in a research project. The research was conducted in the Midlands Province, Kwekwe District.

For the purposes of the study the researcher's population comprised of nine secondary schools, twenty five male mathematics teachers and twenty two female and a population of one thousand eight hundred and sixty students was used.

3.3 The Sample and Sampling Procedures

A sample is a true representative of the target population. Cohen et al (2011) describes a sample as part or subset of the population used to gain information about the whole population. A good sample not only needs to be representative, it needs to be adequate of sufficient size to allow confidence in the stability of its characteristics (Best, 2007). Gay and Airasian (2000) define sampling as a process of selecting a number of individuals for a study in such a way that they represent the large group from which they were selected. According to Marke (2007), a sampling procedure defines the rules that specify how the system calculates the sample size and it contains information about the valuation of an inspection characteristic during result recording.

For the purposes of this study the researcher used the probability sampling, it ensures that the probability of each case being selected from the population is known and is usually equal for all cases. The researcher used random samplings because it gives one of the best ways to achieve unbiased results (Best 2007). Various sampling techniques were used in this study. The purposive sampling method was used in the study due to the fact that it allowed the researcher to

acquire information that would build up arguments towards a deeper understanding of participant's reasons for developing negative attitudes towards learning of Mathematics resulting in poor performance at 'O' level. Another reason for the choice of purposive sampling was based entirely on the judgement of the research in that a sample was composed of elements that contain most characteristics representative or typical attributes of the population (Chibwinja, 2013). The purposive sampling was done in selecting schools so that each school represented the population from different environment such as population from mine schools, high density areas and low density.

In selecting the respondents the simple random sampling was used. According to Chimedza et al (2001) simple random sampling is a sampling procedure that ensures that every member of the population has the same chance or probability of being included in the sample.

From the Kwekwe District only three secondary schools were used. Drake Zisco High a mine school, Rutendo High School (high density) and Kwekwe High (low density). From a population of 1860 students a sample of 120 students was selected. The survey rested on the fact that if the study is conducted in this manner then information can be gathered from using a sample. The three HODS were automatically part of the study and a targeted sample of twelve mathematics teachers, four from each school. The data was gathered from ordinary level students through the use of questionnaires and also HOD interviews. The researcher had to frequently refer to other researches done before hand. A guideline from the supervisor was also sought out.

3.4 Research Instruments

Research instruments are measurement tools which are important in gathering data in a research. The instruments should be reliable, valid and understood by the respondents so that the researcher will gather the correct data. In this study the questionnaires and interviews were used. Cohen et al (2011) explains triangulation as the use of more than one method in data collection.

3.4.1 Questionnaire

A questionnaire is a data gathering method that requires respondents to answer questions in a pre-arranged order. Saunders (2001) defined questionnaire as all techniques of data collection in which each person is asked to respond to some set of questions in a predictable order. He also elaborated that questionnaires can be structured (made up of questions with pre-coded answers)

or unstructured. The advantages of structured over unstructured is that they can provide data that can be analysed easily. On the other hand unstructured questions gave an advantage that they do not limit or restrict the respondent. The researcher used the questionnaire methods as it can be used to collect large quantities of data from a considerable large number of respondents. It is also cheaper and easier to produce and administer. The Likert type of questions were used. Some open ended items which sought to find causes of failure in Mathematics were included.

3.4.2 Interviews

According to Newman (2002) an interview is a direct method of obtaining information in a face to face situation. O' Leary (2010) notes that interviewing is a method of data collection that involve the researcher seeking open ended answers related to a number of questions. There are various types of interviews such as structured, semi structured and unstructured. Interviews enable the researchers to get what they want exactly as there is room for clarity if the respondents fail to understand the demand of a question. A face to face interview ensured high degree of response since it is self-administered. Again the researcher is able to ask additional questions to explore a particular interest that might develop during the interview. However, interviews are not particularly well suited for gaining information from large number of people. They are time consuming and careful attention needs to be given to select informants who will have the knowledge or experience necessary to answer the research questions. Furthermore according to Best and Khan (1993) too often interviews provide information based on what the interviewee think the interviewer wants to hear. Moreover, interviews need quite places and these may be difficult to find. In this study the HOD's offices were used for interviews.

3.5 Data Collection Procedures

Data collection procedures are steps that were taken by the researcher to administer research instruments for the purpose of gathering data for the study. According to Best and Khan (1993) there are two fundamental stages for data collection. The first stage involves appointments with research subjects whilst the second stage requires distribution and administering instruments on the sample.

When the research instruments are approved by the supervisor at Midlands State University, the researcher is given a letter by the Chairperson to proceed to the Ministry of Primary and

Secondary Education Head Office. Permission to conduct the study is sought from the Ministry of Primary and Secondary Education Head Office, the Province, the District, the schools heads and the teachers. After obtaining the permission from the Ministry questionnaires are distributed and interviews held.

The research was conducted in Kwekwe cluster District Secondary Schools chosen in the sample. The purpose of the study was explained to the respondents. The researcher drafted a letter that accompanied the questionnaire. The main purpose of this letter was to introduce the researcher and the topic to the respondents and also give them assurance of confidentiality so that they can respond freely. The researcher made appointments with Mathematics head of departments. Each interview session was scheduled for twenty minutes.

3.6 Data Presentation and Analysis Plan

According to Bogdan and Biklen (2007) data analysis is the process of systematically searching and arranging the interviews and notes from questionnaires, to enable one to come up with findings. Maxwell (2013) hinted that the initial step in data analysis is reading interviews notes and documents that are analysed. The researcher read the data collected from questionnaires administered to teachers and students as well as the interview notes from H.O.Ds. Data is then quantified in number, converted into percentages and finally provide illustration in form of tables, graphs and pie charts.

3.7 Validity and Reliability of the Instruments

According to Jaunder et al (2000), validity is significant as it checks to ensure that conclusions effectively represent empirical reality or whether constructs devised by researches accurately represent or measure categories of human experience. Validity can be easily obtained by selecting the right instruments that measure what is supposed to be measured. In this study validity was ensured through construction of questionnaires for research questions. Adequate coverage of each question gave content validity. The validity was also ensured by constant liaison with the research supervisor. However, as mentioned by Saunders et al (2000) there are several threats to validity and these include bias.

Reliability is the degree to which an instrument consistently measure whatever it is supposed to measure. According to Stuart et al (2001) reliability pertains to the representatives of the results

of the specific sample of the entire population from which it is drawn. This entails that reliability indicates how probable it is that similar relation between variables would be found if other samples were drawn from the population.

3.8 Summary

This chapter elaborated on the key steps that the researcher took in the collection and presentation of data for the research. Various tools and methods that were adopted during the data collection and presentation process were justified. Ideally the purpose of this chapter was to spell out the methodology and the research design that was employed in this study. The chapter focuses on the analysis procedure that were employed in this research. Other important aspects of validity and reliability were also discussed. The next chapter looks at data presentation, analysis and discussion.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

The previous chapter dealt with research methodology which includes the research design and instruments employed to collect data. The targeted population and sample were discussed. The instruments used to collect data were designed following the research questions in chapter one. This chapter focuses on the data presentation, analysis and interpretation. The aim of the research was to determine possible factors that contribute to pupils developing a negative attitude towards mathematics at secondary school resulting in poor performance at Ordinary level.

The data was critically analyzed and discussed against the research questions to determine whether the questions were answered adequately. The research questions were as follows

1. What factors are affecting students in learning and performance in mathematics?
2. How are these factors affecting students' learning?
3. What can be done to improve students' attitudes towards mathematics?

This chapter presented data that was collected using questionnaires for students and teachers. Interviews were done with the HODs. The data was analyzed in form of pie charts, tables and graphs. Demographic data was firstly presented at the analysis of the findings was given with reference to the each research question. Lastly discussions were made relating to the literature review.

The researcher distributed the targeted 120 questionnaires for students. There was a 100% response with a total of 60 males responding and 60 females. For the targeted 12 mathematics teachers only 11 were retained making a percentage of 91.67%. All the H.O.Ds from the 3 schools were interviewed making a total of 100%.

4.1 Research Findings.

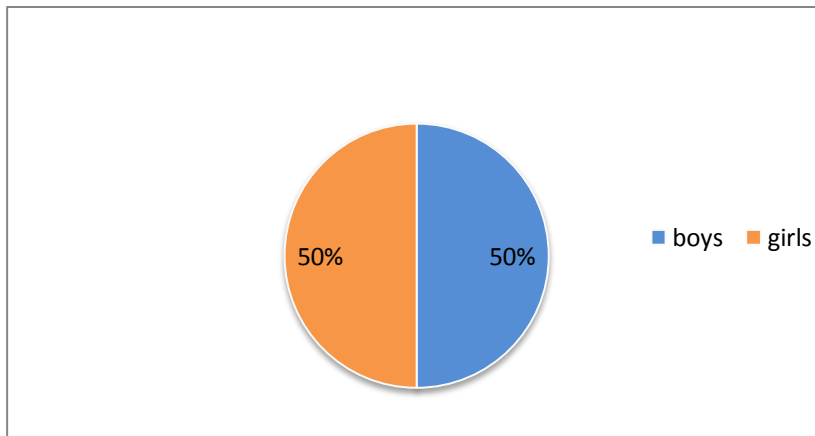
4.1.1 Demography

This section covers gender distribution of the respondents, that is students, teachers and H.O.Ds

A sample of 120 students

Fig 1

60 males and 60 females



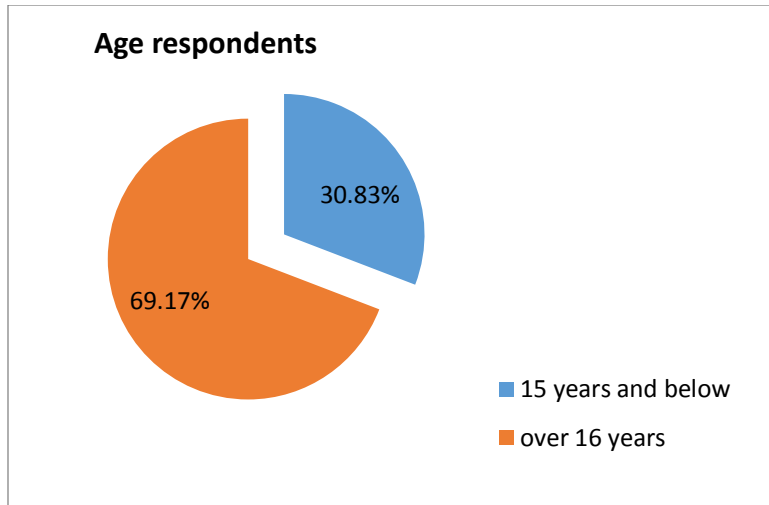
The pie chart above shows that there was gender balance with students respondents

Age of Respondents

Table 1

Age (Years)	Respondents
15 years and below	37
16 years and above	83

Fig 2

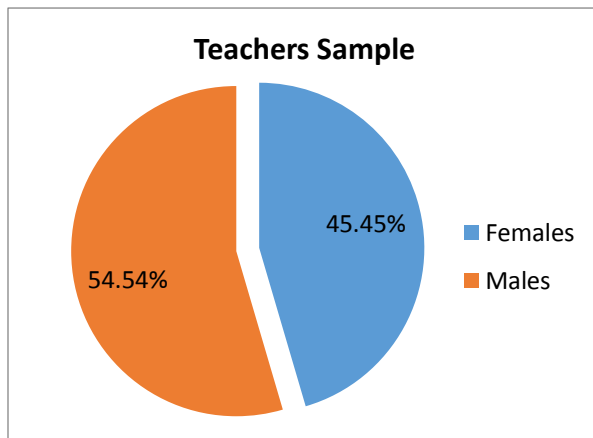


69.17% were students above 16 years and 30.83% were 15 years and below and these are candidates for O level

Fig 3

A sample of 11 teachers

6 males and 5 females



There more males than females in the research

Table 2

Qualification	Frequency	Percentage
CE	6	55
DE	5	45

Fifty five percent teachers are holders of certificate in education whilst forty five percent are diploma holders.

Table 3

The table below showing teaching experience

Teaching experience in years	Frequency	Percentage
1-10	1	9.09
11-15	5	45.45
Over 16	5	45.45

Ninety percent of the teachers have more than 10 years of teaching experience. However if we compare with the teaching qualifications the teachers have the minimum qualification of CE and DE. This shows that teachers are not advancing themselves academically.

Fig 4 showing number of periods per week

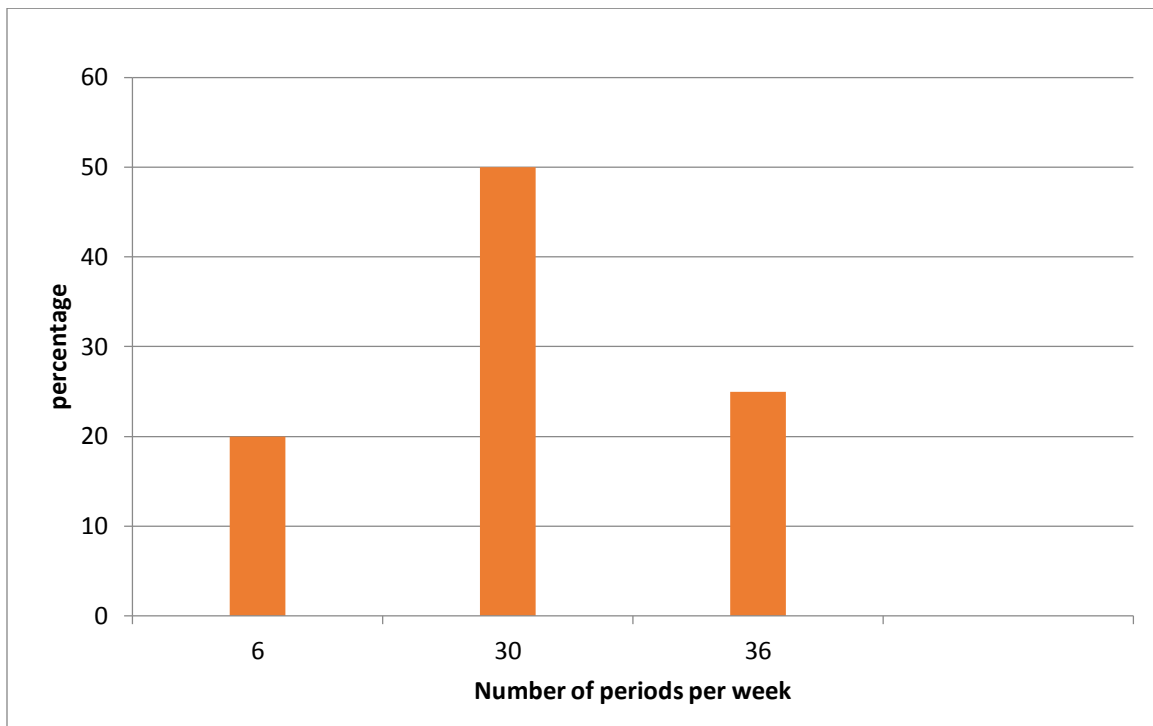
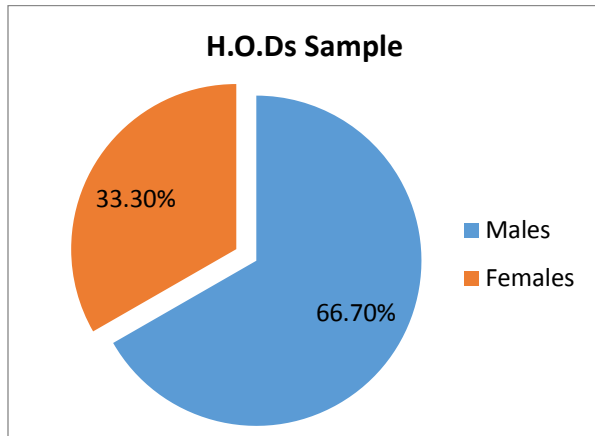


Fig 5 A samples for H.O.Ds

2 males and 1 female



Two male HODs were interviewed and one female HOD

Fifty percent of the teachers have a load of 30 periods, whilst thirty percent have 36 periods. Taking into account the teacher people ratio which is about 1:45 the teacher load is too much.

Table 4

H o d s	Sex	Qualifications	Years of experience
1	M	MED	6 – 10
2	F	DE	11-15
3	M	MBA	over16

Table 4 shows H.O.Ds qualifications and their teaching years' experience. The female H.O.D is a holder of DE whilst the male H.O.D s has MBA and Med Mathematics. Only one H.O.D has a sound knowledge of mathematics because he is a holder of Med Mathematics, whilst MBA can be a higher academic qualification it is not in line with the teaching of mathematics in terms of depth of knowledge, content and skills in teaching mathematics.

4.2 RESEARCH QUESTION 1

Factors affecting students' attitudes towards learning and performances in mathematics

The table below show the responses given by students when they were asked whether they had enough text books.

Resources Factor

Table 5 Textbooks

Enough text books	Frequency	Percentage
Yes	12	10
No	108	90

Ninety percent of the students indicated that they were not having enough text books, whilst only ten percent said they had enough books. The situation of text books was also echoed by teachers who said text books were not enough for the students. Sixty four percent of students indicated that they shared books in the ratio of 1.2 and thirty six percent indicated they shared in the ratio 1.2. Pupil text book ratio was noted with great concern. Students will rotate the textbook on weekly basis which meant that during that period half of the pupils will not be having text books to do homework. Eight two percent of the students indicated that there was internet which was only accessed through the computer lab and there was limit. The use of the internet was discussed with the H.O.Ds and they actually indicated that there were few computers and the internet was down most the time.

Table 6 Furniture

Do you have enough furniture in your school?

Furniture	Frequency	Percentage
Yes	-	-
No	120	100

Hundred percent of the students indicated that they did not have enough furniture in the school. Before starting a lesson students move around the school looking for furniture. Two of the sampled schools were doing hot sitting which shows that even the classrooms are not enough for students. The problem of furniture was noted in all the three sampled schools. Also interviewing the HODs they cited lack of furniture is the school.

4.2 Homework factor

Table 7 Shows how students were given homework

Frequency on homework	Percentage
Daily	45
Twice	20
Thrice	25
Never	10

Forty-five percent of the students indicated that homework was given on a daily basis. Mathematics is a hands-on subject which needs to be practised daily. From the above statistics even though 45% of the student said they were given homework daily. The other percentage shows that teachers do not follow the departmental policy. Maths homework is supposed to be given on a daily basis but 20% of the students said they were given homework twice a week. 25% said three times a week. The students are streamed hence teachers show favour to those classes capable of doing mathematics hence homework is given to them, whilst those classes which are perceived as dull are usually neglected. Hence 10% of the students indicated that they were never given any homework.

Table 8

Frequency on marking	No of students	Percentage
Always	72	60
Sometimes	42	35
Never	6	5

Sixty percent of the students indicated that their work was always marked. There was a hundred percent response in teachers giving feedback. However, even if 60% of the students had their work marked all the time, 35% indicated that their work was sometimes marked whilst 5% said their work was never marked. Not marking students work creates negative attitudes. Pupils need to know how they perform. The teacher's red pen and comments helps students in their learning. When the students realise that their work is not marked that creates a negative attitude towards the subject. Pupils end up giving up on the subject and they concentrate on other subjects since mathematics is a compulsory subject pupils just register and write their examination and just perform badly.

Students were also asked who helped them with their homework. Thirty six percent of the students indicate that they were not being helped by anyone with the homework as shown in the table below.

Table 9

HELPER	FREQUENCY	PERCENTAGE
Parents	28	23.3
Siblings	18	15.0
Friends	31	25.6
No one	43	35.8

Twenty three percent of the students indicated that they were being helped by the parents and fifteen percent by their siblings whilst friends contributed twenty six percent. Homework is very important in the sense that pupils practice what they have learnt in class, by writing their homework. In a situation where no one helps the student, the work goes back to class without being done and most of the time students copy from others without understanding.

4.2.2 Socio Economic Status of the family

Table 10 Show how students frequently carry food to school

OBSERVATION	FREQUENCY	PERCENTAGE
Daily	58	48.3
Often	31	25.8
Never	31	25.8

Forty-eight percent of students carry food to school but this percentage is lower than those who never carry food to school with twenty six percent and same goes with those who often carry food. If we combine never and often we get fifty two percent which is greater than half. This implies that a greater number of students go without food

Table 11 showing students' guardians

Category	Frequency	Percentage
Both parents	51	42.5
Mother	28	23.3
Father	4	3.3
Grand parents	14	11.7
Relative	23	19.2

From the given statistics it can be seen that forty three percent (43%) of the students stay with both parents. However analysing the data you can see that about 57% of the students stay with single parent, grand parents or relatives. Obviously there are lot of negative effects interms of provision for these students. As clearly indicated from the table on how often students carry food fifty six percent (56%) indicated that they did not carry food most of the time

Number of children in the family

Table 12

Number	Frequency	Percentage
1	2	1.67
2	25	20.83
3	34	28.3
4	35	29.17
5 and above	24	20

About forty nine percent of the families have an average of over four children. The bigger the family, the lesser resources are there to cater for all individuals to the fullest. Most children come from a Mine School which has its industry not functional at the moment hence most of the guardians are old people and relatives and they cannot fend for the children. These are not employed and most of the time depends on agriculture

Table 3

The table below show the average distance of students' home from school.

Distance from school in (km)	Frequency	Percentage
1	37	30.8
2	16	13.3
3	10	8.3
4	12	10
Over 5	45	37.5

Thirty eight percent of students travel a distance over 5km to school.

The mode of transport is indicated below

Table 14

Mode	Frequency	Percentage
Walk	65	54.2
Kombi	40	33.3
Car	15	12.5

Fifty four percent of the students walk to school. Not only those who live near the school walk but about fifteen percent of the pupils indicated that they stay over 5 km away from the school and they also walk to school. From the tables it can be seen that the majority walk even those who live a distance of more than 5 kilometres from school. The students have to wake up early in the morning and walk long distance in order to arrive at school early before lessons.

4.3 RESEARCH QUESTION 2

EFFECTS OF THESE FACTORS ON STUDENTS LEARNING AND PERFORMANCE

TABLE 15

SA- Strongly Agree, A- Agree, N- Neutral, D- Disagree, SD- Strongly Disagree

Students' Attitudes	SA	A	N	D	SD
I enjoying leaning mathematics	22	49	14	10	5
Mathematics classes/ lessons are not interesting.	3	9	4	30	54
I would like to continue doing mathematics after completing secondary school education.	25	43	13	4	15
To understand mathematics is difficult.	6	10	7	38	39
Mathematics is very useful in life.	68	24	4	3	1
I think it is the teacher who can make mathematics easier.	31	39	12	13	5
Among the subjects taught mathematics is my favorite.	36	37	5	16	6
I am given a lot of unnecessary mathematics assignment.	4	5	6	30	55
I feel extremely anxious and fearful, when mathematics examinations are mentioned or brought.	20	25	9	30	16
Mathematics should not be a compulsory subject.	7	4	4	25	60
I do a lot of mathematics exercises on my own or with a friend.	36	44	4	10	6
Mathematics is impossible to learn.	6	5	6	27	56
Learning mathematics is just remembering what the teacher says and does while in class.	22	27	9	21	21
The best way to learn mathematics is to discover a concept by oneself.	35	30	12	15	8
My grades/marks are always low in mathematics.	16	33	6	30	15
I do mathematics for the sake of it.	5	4	7	28	56
I like my mathematics teacher.	59	31	4	3	3
My friends do not like learning mathematics.	61	30	2	4	3
My parents and siblings encourage me to learn mathematics and to perform well in the subject.	60	27	4	5	4

Twenty two per cent (22%) and 49% of students agreed that they enjoyed learning mathematics. Fifty four strongly disagreed that in Mathematics classes are not interesting. In this view it can be seen that pupils enjoy learning of mathematics. Forty three indicated that they would like to continue doing Mathematics after completing secondary schooling. Thirty nine of the students strongly disagreed that Mathematics was difficult to understand hence thirty nine percent agreed that it is the teacher who can make them understand the subject. Fifty five percent of the students strongly disagreed that they were given a lot of unnecessary Mathematics assignment. Sixty percent of the student strongly disagreed with the factor that Mathematics should not be a compulsory subject hence people recognise its usefulness in life.

Twenty seven percent students agreed that mathematics is just remembering what the teacher says and does while in class, hence the students' role model their teachers. Thirty five percent of the students strongly agreed that the best way of learning mathematics was to discover a concept by oneself. However thirty three agreed that their grades were low in mathematics.

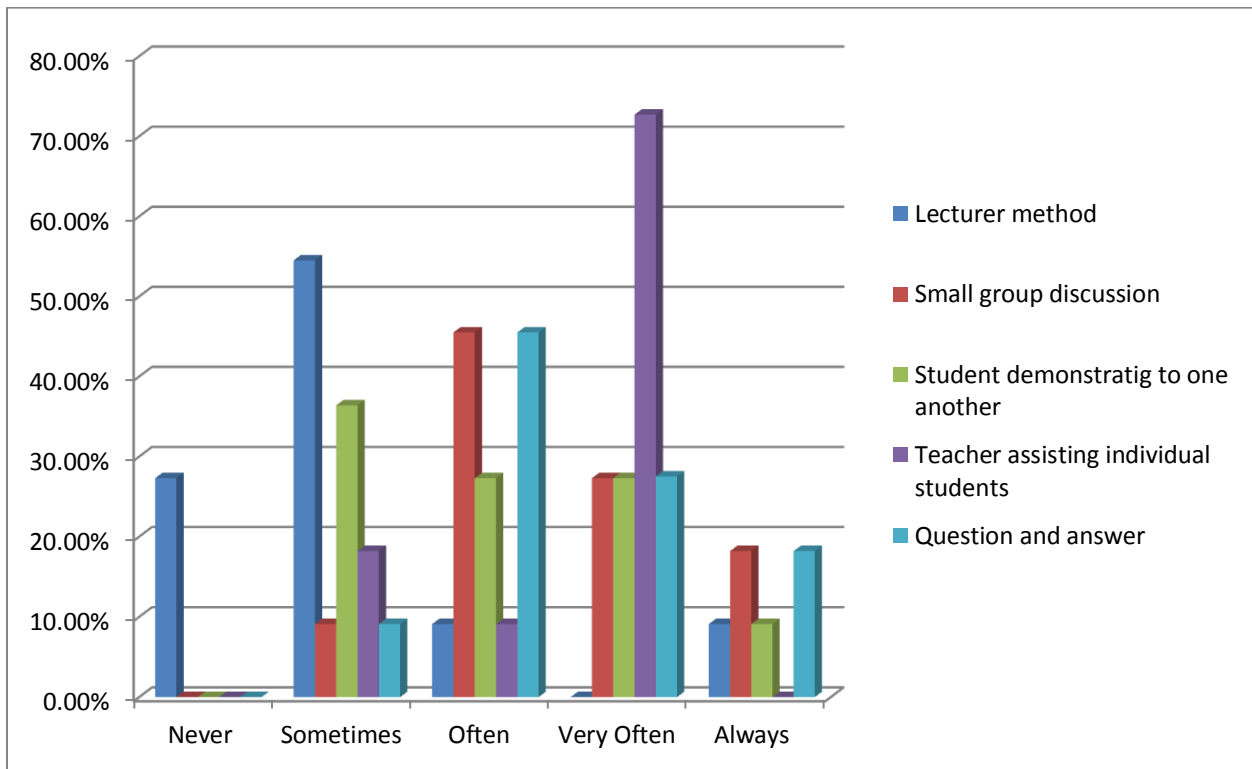
Fifty six percent strongly disagreed that they did mathematics for the sake of it. Fifty nine percent strongly agreed that they liked mathematics teachers. Forty four percent agreed that they were being helped by their friends in doing homework. However sixty one percent indicated their friends do not like mathematics. Sixty percent of the students strongly agreed that the parents and siblings encouraged them to learn Mathematics.

4.3 RESEARCH QUESTION 3

SOLUTIONS TO IMPROVING STUDENTS ATTITUDES AND PERFORMANCE IN MATHEMATICS

Rating of the method preferred is as follows Never (N) sometimes (S), Often (O) very often (VO), Always (A)

Fig 6 Methods of teaching Mathematics



Methods used by teachers to improve students learning and understanding of concepts. As indicated before about sixty five percent of the students indicated that they understood better when they discover a concept by oneself. About forty five percent teachers indicated that they used small group discussion in their teaching and about thirty seven percent students demonstrated to one another how to solve problems. Seventy three percent of the teachers indicated they assisted individuals but with the work load that the teacher has and pupil teacher ratio the researcher wondered on how teachers managed individual assistance with all their students, considering that each lesson is only about thirty five minutes. Nine percent of the teachers indicated that they always used the lecture method for the coverage of the syllabus. The

question and answer method was often used with a percentage of forty five percent. These different teaching methods can help the students understanding the subject since they are mostly child centred than teacher centred.

Methods of motivating students

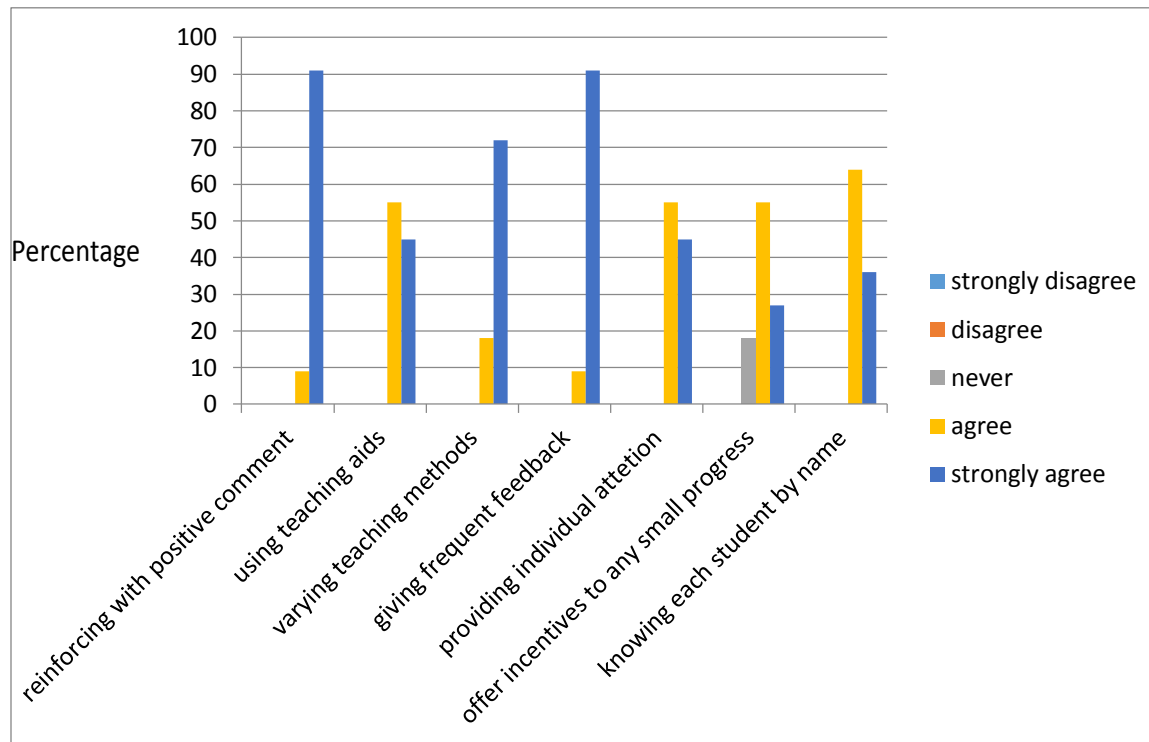


Fig 7 Methods of Motivation

Ninety percent of the teachers give positive comments on students work if they perform better and encouraging comments are given where students seem to struggle with the work. Sixty two percentage of teachers agreed that knowing pupils by name helps pupils in their learning. Ninety percent of the teachers strongly agreed that feedback improves students learning. Hundred percent of the students agreed that they were always given feedback

4.4 DISCUSSIONS

Factors affecting student's attitudes towards learning and performance in mathematics

4.4.0 IN SCHOOL BASED FACTORS.

4.4.1 LEARNING RESOURCES THAT IS TEXTBOOKS, INTERNET AND FURNITURE.

Ninety percent of the respondents revealed that they did not have enough textbooks whilst only 10% said had enough. This situation of textbooks was further elaborated by teachers who said textbooks were not enough. Most students indicated their ratio of sharing to be 1:2, with 63.7% whilst the ratio of 1:3 was given by 36.3%. Pupil textbook ratio was noted with great concern. Students will rotate the textbook on a weekly basis which means that during that period almost half or third of the pupils will not be having any access to the text book. This placed students at a greater risk of high failure in their academic work due to inadequate sources of information. Eighty two percent of the students indicated that there was internet at the school in the school computer laboratory and there was time limit into the access. The idea of internet was discussed with the H.O.Ds and they actually showed some concern because even though there were few computers the internet was most of the time down. Only a few students did have access at a time.

Some of the books which were donated by UNICEF were not widely used. For example Mathematics for Today was given to students but the teachers uses New General Mathematics which is usually one copy for the teacher. This is one of the books (N.G.M) mostly used in secondary schools. Most of the homework is given from that book which means only a few students with personal copies benefit. This causes some pupils failing to do their homework most of time. Students copy homework before the lesson. When this happens only a few individuals understand the concepts and the rest just copy. This result in students developing a negative attitude towards the subject because as the teacher revises the work they will be talking to a few students who did the work, the rest is lost. In their research Adebjei and Owoeise, (2002) found that there was a significant relationship between the use of recommended textbooks and academic performance. According to Psacharopolous and Wood Hall (2005) textbooks are a major input in performance in examinations.

The school in which one attends has a great play in the performance of the children. Hundred percent of the students indicated that they did not have enough furniture in the school. Some schools do not have enough classroom blocks as a result hot sitting is done. This is like having two schools in one. Student who attend school in this set up obviously do not have enough time to study because they have the morning session from 7am to 12 noon whilst the afternoon session begins and end at five pm. All this is a disadvantage to those attending these schools compared to those who start school at 7am and dismiss at 4pm. The latter have more time to study under school environment whilst the former go home early or come to school later in the day of which most of the homes are not conducive for studying. Furthermore most public schools do not have enough furniture. Students move up and down looking for furniture from other rooms. This is time consuming and worse still those schools in hot sitting lessons are shortened to 30mins instead of 35mins. This means that student spend less time with their teachers for instruction. Without enough resources this becomes a challenge to the majority of students. Mathematics is a hands-on subject a lot of practice is needed. Citing lack of resources students might fail to do their homework and attitudes develop negatively.

Two schools visited showed that they had hot sitting suggesting that the population in the area is greater than what the school can accommodate at a time. These students are placed at a disadvantage because they only have half of their day compared with their counterparts who attend normal school. These factors contribute negative towards the students learning because most homes do not have an educational environment and students spend more time at home. Depending on the school environment schools can either open or close the doors that lead to academic performance Barrg (2005). In the schools teacher pupil ratio is 1:45 which means classrooms are over crowded. Overcrowded classrooms make it virtually impossible to carry out the kind of individualised and performance oriented instruction essential to meet the standards, Crosnoe et al (2004).

4.4.2 TEACHERS QUALIFICATION AND TEACHING OF MATHEMATICS.

Teachers are qualified with a minimum of Certificate in Education 54.55% and Diploma in Education 45.45%. No teachers are degree holders from the sample. Van Hooft, (2005) posits that higher trained mathematics teachers at all times are equipped with proper skills and knowledge and this make them deliver and offer quality teaching to pupils. It is against this

background that teachers who are diploma and certificate holders are not well qualified to teach mathematics especially at “O” level because they lack depth content theory of education and effective pedagogy hence this leads to low pass rate. Similar findings from other studies also reported that quality teaching involves teachers who are competent with adequate knowledge and skills relevant for effective classroom management, pupil assessment subject teaching and those who engage in regular professional learning (Pollard and Tam1993). Mathematics teachers who lack the highlighted attributes are likely to negatively affect pupils’ acquisition of mathematical concepts which can eventually result in negative attitudes towards mathematics which lead to low pass rate at ‘O’ level. From the interviews made with the H.O.Ds the researcher discovered that the pass rate was below the national pass rate.

.4. 4.3 Teachers’ Teaching Experience.

Teachers have more experience in teaching mathematics. Ninety percent of the teachers had more than ten years teaching experience. However comparing the number of years of experience and academic qualifications, it seems the teachers are not advancing themselves academically. Hence this has a negative effect in the sense that most of the methods of teaching might be teacher centered and little involvement of students. However Mondoh (2005) posits that teachers with many years of experience in teaching understood the subject matter as well as teaching methodologies that may positively influence students’ attitude towards learning mathematics.

Two male H.O.Ds are degreed whilst the female H.O.D holds a Diploma in Education. Only one H.O.D has a sound knowledge of mathematics because he is a holder of Med Mathematics, whilst MBA can be a higher level of academic qualification but is not in line with the teaching of mathematics in terms of depth of knowledge of the content and skills on teaching mathematics. From the research findings eighty two percent (82%) of the teachers are full time mathematics teachers with full load. From the teaching load most teachers have loads of 30 periods per week which is the recommended maximum load but however about 30% of the teachers had 36 periods. Twenty percent of teachers had 6periods. However with these loads and the ratio of teacher to pupil is too high. There is much work for teachers which might result into less attention to individuals in terms of assistance. Heavy teaching work load has a potential to compromise the quality of teaching since over worked teachers may not have time to plan for their lessons, fail to attend some classes, attend lessons late or fail to mark student work. This has

been indicated by the questionnaire on frequency on marking whereby 35% of the work is sometimes marked and 5% said their work was never marked. The resultant poor teaching methods and strategies enhance negative attitudes towards learning and performance in the subject making the students to realize it's difficult. The teachers who had six lessons constituted about 20%. These were not full time mathematics teachers. They were relief teachers who had their own loads in their departments. As indicated by the H.O.Ds 66.67% said that they did not have enough teachers in their departments.

4.4.4 Social and Economic Status of Students' Background.

In finding out the student's background the following data was collected. Whom do you stay with? Five categories were used. It was noted that 42.5% of students stay with both parents whilst 57.5% stayed with single parent, grandparents or relatives. Obviously there are a lot of negative effects in terms of provision for these students. Some of the respondents came from abandoned mine school because the industry is not operational that means the sources of income differ and most grandparents are too old to fend for these students. According to Theresa and Michael (1995) they associate low income with insufficient funds to pay fees, buy uniforms, afford transport costs to mention just a few. This can lead students to be isolated bullied and stigmatized. Furthermore children from low income are more likely to suffer from ill health which can affect their attendance and performance in school. Mathematics is a subject which needs more concentration, lack of concentration might result in developing negative attitudes towards the subject. Divorce can also affect the performance of students in school since it can be seen from the table that 23.3% of the students stay with their mothers only whilst 4% stay with their fathers only. Some researchers made a survey and concluded that children from divorced homes perform worse in mathematics, reading and spelling. According to Mott (2005) parental presence influences girl performance in mathematics. Teenagers who experience parental divorce score low than their counter parts from intact families in mathematics Youngmin etal (2009).

Forty nine percent of the families had more than four children. The bigger the family the less resources are there to cater for all individuals to the fullest especially in situations where there is no employment and people depend on agriculture which is also dependent on the weather. From the findings forty eight percent of the students managed to carry food daily to school which

means that some parents cannot afford giving food to their children. Spending the whole day without eating is a difficult task to handle especially when the mind is busy learning. Homework is one of the critical parts in learning of mathematics. Mathematics is a hard on subject which needs a lot of practice to be clearly understood and to grasp the concepts. Without practice mathematics becomes a very difficult subject to pass. At times students need assistance with their homework but from the findings thirty six percent of the students did the home work on their own. With this situation if the student did not understand the concept in class they may not be able to do homework on their own. Twenty six percent of the students said were being helped by friends of whom sixty one percent actually indicated that their friends did not like mathematics. These results have serious implications in the sense that if no one is there to help the student will go back to school without answering the given questions and this would result in them getting seriously lost when solutions are discussed in class. The time spent in class is only 35mins of which there is a possibility that students might not grasp the concepts as they are being taught and homework is there to complement what has been taught.

According to Acelajdo (2004) he posits that there is a substantial influence of parents on their children's educational aspiration and it is much stronger than that of peer. Parents have to be there to support their children through education helping them with homework and also passing positive comments about the subject mathematics. Anthony and Walshaw, (2007) says comments given by parents affect the students especially if the parents are not able help to the child with homework and they air their sentiments that the stuff is difficult and it makes them nervous. Most parents who were not good with mathematics find it difficult to help their children with homework. According to the survey 25.8% said that they are helped by friends in doing homework. However there is peer pressure as students interact with each other in secondary schools. According to Costello (2001) peers may influence others that mathematics is unfeminine. There is a lot of peer pressure and distraction in choosing a friend to help with homework you have to choose a friend who is good in mathematics so that they be of good influence rather than influencing negatively. Choosing friends at this stage is very important. Some are slow learners and some are fast learners. It is important to choose friends who are most gifted in mathematics so that they boost the level of understanding the subject matter. However some students might end up developing negative attitudes when they realize that they are not gifted and most of the time they get wrong answers.

Thirty seven percent of the students stay more than five kilometers away from school. The majority of the students walk to school with 54.17% followed by the use of kombi with 33.3%. Only a few 12.5% use private cars. When asked whether students have problems or have been absent from school due to distance the statistics indicated that only 4% had problems but the majority 96% had no problems in getting to school. From the findings it can be seen that majority walk even those who live a distance more than 5km from school. The students have to wake up very early in morning and walk long distances in order to arrive at school early before lessons. Furthermore walking is tiresome. This might cause students to feel sleepy during lessons. This has negative implications to learning and negative attitudes might develop due to lack of concentration.

Hunger is another factor which might contribute to lack of concentration in school. 48.3% carry food daily to school with the equal numbers of never and often carry food to school. Mathematics is a subject which needs too much concentration hence students can hardly learn with empty stomach. Lack of concentration leads to negative attitudes because students are lost along the way during mathematics lessons and at times it becomes difficult for them to catch up. According to Graetz,(1995) ones educational success depends very strongly on the social economic status of the parents.

4.5 Research Question 2

4.5.1 Students attitudes towards learning and performance in mathematics

From the findings pupils showed that they had a positive attitude towards learning of mathematics,. If we combine the percentage of those who strongly agrees and those who agreed their percentage is about 71% which show that they enjoyed learning mathematics. When you enjoy learning mathematics it shows that you have a positive attitude but this kind of attitude is not reflected by the result that the student produce at O level. The pass rate in schools is very low. Hence now the question arises with the effect of cause of failure. What is it then that demotivate them such that they come out with poor performance? Further analysing the findings it was seen that the stage of adolescent and peer pressure have an influence on the students. Sixty one percent of the students strongly agreed that their friends did not like learning mathematics.

Furthermore about 26% of the students indicated that they were being helped by friends in doing their homework. It is at this stage of their education that the students must choose their friends carefully.

According to Costello (2007) peers may influence others that mathematics is unfeminine. Furthermore Tobias (2003) posits that when a child is not gifted or a slow learner they might end up being afraid of their fellow students from discovering their weakness. That fear leads pupils to be puzzled and as well be unable to seek help from other pupils or teacher as a result they are not able to overcome the abstract to mathematics hence they develop negative attitudes which in turn leads to poor performance. From the findings 68% of the students indicated that mathematics is very useful in life. Sixty percent of the students strongly disagreed that mathematics should not be a compulsory subject. There is a clear indication that students realise the importance of mathematics but how to achieve in the subject is another story. A student look upon their teachers for them to perform better in mathematics as shown by the statistics that 56% strongly disagreed that mathematics was difficult to learn and 49% agreed that mathematics is remembering what the teacher says and does in class. This shows that a teacher has a big role to play in making the pupils realise their intelligence in the subject. According to the Old Humanists Theory cited in Ernest (1989) mathematical ability is inherited the teacher is there to facilitate the students to realise the potential. Furthermore the students showed that the best way to learn mathematics was to discover a concept by oneself. This implies that the methods used by teachers in delivery of the content are very important. When students do the work on their own it is very easy to remember the concepts rather than just being taught using the procedural methods.

Thirty three percent of the students indicated that their grades were generally low in mathematics, whilst about 45% agreed that they feel extremely anxious and fearful when mathematics examinations are brought. According to Hoyles (2002) he posits that 14 years old students tend to associate their mathematics experience with feeling of anxiety and failure. When a student has repeated failures in mathematics it could be in-class exercises or test a student might feel that the subject is difficult and hence they cannot do it. This gives a feeling of being defeated and hence negative attitudes tend to develop and students concentrate on other subjects

where they perform better. Twoli (2006) ascertains that repeated low achievements in mathematics examinations may lead to unfavourable attitudes towards mathematics learning.

Sixty percent of the students strongly agreed that the parents and siblings encourage them to learn mathematics and perform well in the subject. Aceladjo (2004) ascertains that a substantial influence of parents on their children's educational ambitions is much stronger than that of peers. Studies have shown that parents who are knowledgeable, aware and more involved with their responsibilities bring up their children having a more positive school attitude and better academic performance. Anthony and Walshaw (2007) ascertain that comments given by parents affect the students. Hence parents have a role to play in reinforcing positive attitudes towards students learning of mathematics. Quilter and Harper (2003) posits that many student end up having negative attitudes towards mathematics because of the way it is being taught, furthermore mathematics teachers present O' level mathematics as being difficult and only accessible to the select few. Some students can attribute poor performance to the family's poor performance in the subject. This kind of attribution might be difficult to change because the student has no role models at home.

However even if the statistics show that pupils have a positive attitude towards mathematics the researcher felt that students have a big role to play in performing better in the subject. Their attitudes are reflected negatively by the results. Passing mathematics means working very hard on the part of the students. Students will actually have a reason for their failure. Some blame the parents of not being able to do mathematics whilst others blame teachers. Working hard and having goal oriented performance can boost the student's morale themselves rather than blaming other people. Students have to work to change what they might have believe was impossible to achieve, is made possible by their hard work. Practising seeking help form teachers will help students to find a way of improving in Mathematics.

4.6 Research Question 3

4. 6.1 methods of teaching and motivating student's attitudes towards mathematics?

Methods used in teaching to enhance learning of mathematics.

54.5% of the teachers sometimes use the lecturer method whilst 27.3% said they ever used the lecturer method. With a percentage of 9.1% teachers indicated that they always used the lecturer method whilst another 9.1% used it oftenly. The lecture method helps in the content coverage but it has a disadvantage that it is teacher centered. Small group discussions were oftenly used by teachers and this helps in the sense that students get involved and get the concept better through discussions. About thirty six percent of the teachers used method of student demonstrating to each other oftenly whilst 9.1% always used that method.

Question and answer was often used with 45.5% and very often with 27.5%. Teacher assisting individuals was the method which was commonly used by the majority of the teachers. 90% of teacher respondents always reinforced students with positive comments to help them improve their attitudes towards learning and performance in mathematics. About 45.5% used teaching aids very often to enhance students' understanding of the topics being taught. In addition varying teaching methods was always adopted by 81.8% of the respondents. 90.9% always gave frequent feedback to students. On question and answer exercises are done to help students enhance their understanding of the content. Providing individual attention 54.5% of the respondents agreed that the method was aimed at addressing students 'specific weaknesses in learning the subject.

Offering incentives to any small progress 54.5% of the teachers agreed that it helps to improve the students' learning especially the poor performers. Knowing each student by name 63.6% agreed that the method gives a sense of individual attention and enhance close relationship between the teacher and the students.

Besides using the different teaching methods in enhancing learning and improve students attitudes the teacher aired views that practical examples can be used. Some teachers believed that students from different schools should interact through workshops and seminars. Schools to develop quiz in mathematics where by students compete and the winning school is given incentives. This will encourage students to work hard use more textbooks rather than relying on one textbook. Students will be encouraged to use the internet to boast their knowledge. Parents

and schools have to work together to facilitate student learning. Parental support is very important and it boost student moral towards learning. Schools should avail latest I.C.T knowledge to learners with parents installing Wi-Fi at homes so that the pupils can access internet even at home.

Team teaching can also be implemented so that teachers can exchange ideas and weakness on a certain topic by one teacher can be complemented by the other. Teachers to be encouraged to use child centered teaching methods like discovery learning, projects, group discussion to mention just a few. Teachers to develop patience when dealing with slow learners. More time is needed with these students hence policy makers need to consider the needs of the slow learners and develop a curriculum that will also benefit them. Students to be encouraged to work hard and do all assigned work by teachers themselves and avoid copying from others.

The importance of mathematics is for students to regard mathematics as a subject not only crucial to passing the examination but a practical tool for day to day use. The data on whether students will use mathematics a lot in life to some extent indicate that some students cannot see the functional aspects of mathematics in their later life despite students viewing mathematics as a subject being abstract and not applicable to real life situation. There is a need to change students' attitude from learning mathematics just as a compulsory requirement in schooling and for passing to realizing the functional value of mathematics by letting students see the vital connection between attitudes learning, passing well in examinations and application of mathematics to real situation.

4.7 SUMMARY

This chapter made use of pie charts, tables and bar charts, for data analysis and interpretation. In some cases raw data was also analyzed using percentages quantifications. Responses were analyzed and interpreted under relevant subheadings. Factors that contribute to negative attitudes were taken from the students, teachers and H.O.Ds. Discussions were also made in relation to related literature review. The next chapter is going to deal with summary, conclusion and recommendations for the researcher.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter reviews the major highlights of the research and gives a brief of the whole study. The chapter also discusses the major conclusions drawn from the research findings. Recommendations for further study were also given.

5.1 Summary of the Project.

The major focus was to examine the factors that contribute to negative attitudes by students towards learning and performance in mathematics, resulting in low pass rate at O'level. The researcher was motivated to embark on the study because most pupils develop a negative attitude towards mathematics at secondary school resulting the students failing at O'level even though they had passed with flying colours at primary school.

Chapter 1 provides a brief description of the study in which the background of the study was discussed. Even though mathematics is seen as a base for scientific and technological knowledge that is vital for socio economic development of a nation there is generally low pass rate in the subject. The statement of the problem to be investigated which were the factors contributing towards the formation of negative attitudes by students in learning and performance in mathematics in Kwekwe urban schools were highlighted. Research questions and the significance of the study to the researcher were highlighted with descriptions limitations, delimitations and definitions of terms given.

Chapter 2, the relevant literature was reviewed which relates to out of school based factors which involve inherited intelligence, social economic status of parents and their attitudes adolescent stage, peer pressure and the community. The in school based factors were also taken into account, these involved the teacher, the teaching methods used, the motivation techniques and the school environment.

Chapter 3, the research design was as a guideline within which a choice about data collection method has to be made. According to Bless and Hiyson (1995) research design is defined as a

programme that guides a researcher in collecting analyzing and interpreting observed facts. Descriptive survey research design was used to elect information cornering factors that contribute to negative attitudes in mathematics resulting to low pass rate at O'level. Population was defined as a group of elements or individual objects or events that conform to specific criteria and to which we intend to generalise the results of the research (Mc Millan, 2006). A sample was described as a sub unit of the population. The target population for the study was students from secondary schools, mathematics teachers and H.O.D's. The sample used for the purpose of this study was made up of 3 H.O.D's, 11 mathematics secondary teachers and 120 form students. The study was guided by three research questions:

- (i) What factors are affecting students towards learning and performance of mathematics?
- (ii) How are these factors affecting students learning?
- (iii) What can be done to improve student attitude towards mathematics?

Instruments that were used in the collection of data were basically questionnaires and interviews. Research ethics were also valued and considered in the study.

Chapter 4 focused on data analysis discussion and presentation basing on the collected data from students, teachers and H.O.D's, through the use of different research instruments. Data was presented by means of tables, pie charts and bar graphs.

5.2 Summary findings;

Analyzing the factors that contribute to the influence of negative attitude, the social economic status of the parents comes to play. Some students indicated that they went to school without food, which implies that learning and concentration becomes difficult for such students. Some indicated that they walked to school. While some had to travel distances over 5km. Furthermore students indicated that they stayed with grandparents, relatives and single parent.

In regards to attitudes towards mathematics as a subject most students said that they enjoyed learning mathematics as a subject. In addition students disagreed that mathematics class lessons were not interesting yet this percentage fail to post good performance in the subject. Out of those who registered strong interest in mathematics they strongly agreed that they would like to

continue doing mathematics after secondary school. Only a few of the respondents strongly agreed that mathematics was a very useful subject in life. Most of the respondents strongly disagreed that they were given a lot of unnecessary mathematics assignments. With regards to attitude related to mathematics teachers most of the respondents either agreed or strongly agreed that it was the teacher who could make mathematics learning easier for them.

Most of the teachers reported that they had been teaching mathematics for more 10 years. With many years of teaching experience teachers are more likely to understand the subject matter as well as teaching methodologies that may positively influence student attitudes towards learning of mathematics. 100% of the teachers showed that they liked teaching mathematics very much. According to teachers of the response lecture methods was never used to enhance learning mathematics but was sometimes used. The majority of teachers always reinforced students with positive comments to help them improve their attitudes towards learning and performance in the subject. Teaching aids were used to enhance students understanding of the topic being taught. In addition varying teaching methods were always adopted by teachers.

5.3 Conclusions:

Research findings have shown that negative attitudes affects pupils performance in mathematics resulting to low pass rate at O'level. These negative attitudes develop due to repeated failures in progress test during the course. Students are demotivated by low passes. Therefore teachers need to find means of building positive attitudes which can be promoted by teaching methods which are student centred. Secondary school students know that mathematics is important and they seem willingly to learn mathematics as indicated by the positive attitude from the findings. However students attitudes acquired from previous experience in the subject, teachers, parents and peers influence affected their learning of the subject. In addition school teachers must be aware that there are certain aspects of students learning in mathematics that need to be improved. In particular students should be given more opportunities to work on non routine and challenging mathematics problems so as to maximize their thinking skills and value the intrinsic essence of mathematics, this will require teachers going the extra mile in leading the students in that path of learning. The subject should not be limited to theoretical teaching and focused on

passing examinations only. In this sense mathematics should be demonstrated in a more practical way by which students can spontaneously associate mathematics knowledge with their everyday environment by doing so. The engagement and exposure will result in students better perspective of mathematics and their mathematics learning which in turn will help to develop positive attitudes towards the subject and therefore further promote their learning ability and consequently perform better in mathematics examinations.

5.4 Recommendations

From the research problem and results it is recommended that;

To instil positive attitudes towards learning and performing well in mathematics there is need of team spirit from teachers, parents, the community, the school and an other stake holder to work together to enhance these positive attitudes. To mitigate on the inadequacy of teaching learning materials and equipment's the government needs to enhance their provisions to schools. It should extend loan facilities and bursaries to secondary school students from poor families

Not only students in rural areas are affected by hunger but also students in urban areas need assistance. The school and the parents together with the administrators should advocate for food relief in schools as indicated from the research some students could not afford to carrying food to school hence if the community and other educational community stake holders can work together to alleviate this problem by at least providing one meal to the students.

Mathematics teachers should wisely utilize available learning resources to enhance positive attitudes. Teachers need to be computer literate so that they could not run away from technology. Nowadays the use of collaborative learning is important. The government and other stakeholders such as nongovernmental organisation need to sensitise the local communities on the importance of mathematics in day to day life activities and also to eradicate gender stereotyping.

The ministry of education and schools management should motivate teachers especially after the release of examination results. This might be in the form of recommendations for promotion, subsidizing of house rents, and also providing stands for teachers. This might help qualified teacher to stay rather than moving away to seek greener pastures. There is successive connection

between attitudes, learning, performance and practical utility of mathematics. This connection should be established early enough in student mathematics education.

The ministry of education should review the curriculum to make it relevant and flexible to the diverse needs of different regions and background of the students. The curriculum should also design a syllabus to cater for slow learners or the less gifted in mathematics. The ministry of education through district education offices conducts in service programmes for teachers.

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Appendix A

QUESTIONNAIRE FOR STUDENTS

I am a student at Midlands State University undertaking a degree programme in mathematics. The main aim of the study is to investigate the factors causing negative attitude towards mathematics at secondary schools resulting in low pass rates, in Kwekwe urban schools. Your cooperation in in answering this questionnaire will go a long way in assisting me to come up with an authentic study. Your response shall be treated in the strict confidence and shall be used only for the purpose of this research. Your response is greatly appreciated. Thank you in advance.

Please respond by a tick in the boxes provided and where you need to explain further use the spaces provided.

N.B. The answer given by the respondents are completely confidential. Honestly in answering the questions is of paramount importance to the researcher. No names are written on this questionnaire.

SECTION A

1. Gender

Male Female

2. What is your age?

13 years 14 years 15 years

16 and above

3. Whom do you stay with?

Both parents Mother Father

Grandparents Relatives

4. How many children are in your family?

One Two Three

Four Five and above

5. Who helps you with homework?

Parents Siblings Friends

No one

6. How far is your home from school?

1 km 2 km 3 km

4 km 5 km and above

7. What mode of transport do you use to get to school?

Walk Bus/Kombi Car

Bicycle

8. Do you sometimes fail to get to school because of distance?

Yes No

9. How often do you carry food to school?

Daily Often Never

10. Who is the bread winner in your family?

Parents Father Mother

Yourself Grandparents Relatives

11. Do you sometimes remain home to attend to given work because of gender?

Yes No

12. Do your guardians' assist you with buying mathematical instruments, graph books and calculators?

Yes No

SECTION B: GENERAL INFORMATION ABOUT THE STUDENT AND SCHOOL.

1. Who inspires you the most in learning of mathematics?

Parents Peers Teacher

Siblings

2. Are you given enough time to practice and discuss mathematics in class?

Yes No

3. Do teachers use learning aids during lessons?

Yes No

4. How frequently are you given homework?

Daily Twice a week thrice a week

Never

5. How frequently is your homework marked by your teacher?

Always Sometimes Never

6. Does your teacher give feedback on your marked work?

Yes No

7. Does your school have internet access and computers?

Yes No

8(a). Do you have enough text books in your school?

Yes No

(b). If no how do you share?

1:2 1:3 1:4 1:5 or more

9(a). Do you have any interests in learning mathematics?

Yes No

(b) If yes what inspires you

.....
.....
.....

(c) If no what is your problem

.....
.....

SECTION C: STUDENTS ATTITUDES TOWARDS LEARNING AND PERFORMANCE IN MATHEMATICS

INSTRUCTIONS: This section has students that are to decide carefully whether you strongly agree (SA); Agree (A); Neutral (N); Disagree (D) or strongly disagree (SD). Put a tick against each statement depending on your feelings. If you make a mistake cross by putting an (x) through the tick and then tick in the appropriate box in the table below.

Students' Attitudes	SA	A	U	D	SD
I enjoy learning mathematics					
Mathematics classes/lessons are not interesting					
I would like to continue doing mathematics after completing secondary school education					
To understand mathematics is difficult					
Mathematics is very useful in life					
I think it is the teacher who can make mathematics learning easier					
Among the subjects taught, mathematics is my favourite					
I am given a lot of unnecessary mathematics assignments					
I am well provided with mathematics textbooks and other learning resources					

I feel extremely anxious and fearful, when mathematics examinations are mentioned or brought					
Mathematics should not be a compulsory subject					
I do a lot of mathematics exercises on my own or with a friend					
Mathematics is impossible to learn					
Learning mathematics is just remembering what the teacher says and does while in class					
The best way to learn mathematics is to discover a concept by oneself					
My grades (marks) are always low in mathematics					
I do mathematics for the sake of it					
I like my mathematics teacher					
My friends do not like learning mathematics					
My parents and siblings encourage me to learn Mathematics and to perform well in the subject					

Appendix B

TEACHERS QUESTIONNAIRES

The researcher is a registered student at Midlands State University for a bachelor of education degree in mathematics. The researcher study seeks to unearth the factors that contribute to negative attitudes which result to low pass rate in mathematics ordinary level. The study is conducted in partial fulfilment of the above degree course. Your contribution is of paramount significance and the findings gathered here are for study purposes only. All information shall be kept confidential and for the sake of anonymity no names must be included in this document. Please carefully read through the document and fill in all details use a tick in the appropriate box with the relevant answer to provide relevant information where necessary.

SECTION A: BIOGRAPHICAL DATA

1. Gender

Male Female

2. Teaching experience.

1-5 years 6-10 years 11-15 years

Over 16 years

3. Level taught.

ZJC O' Level A' Level

4. Academic qualification.

C.E B.E B.E.D

M.E.D

Other specify

.....
.....

Section B

TEACHING INFORMATION

1. How many lessons do you teach per week?

.....

2. How many years have you been in the current station?

Less than a year 1- 5years 6-10years

11- 15years over 16 years

3. Do you like teaching mathematics?

Very much moderately Very little

Not at all

4(a). Do your students attach a lot of value to mathematics as a subject?

Yes No

(b). Why

.....
.....

5. What is the general attitudes of your students towards learning mathematics?

Very positive Positive Negative

Very negative

6. Is the current mathematics content in the syllabus relevant to the needs of the society?

Relevant Not relevant Somehow relevant

Very relevant

7(a). Do you have any problem with the syllabus of mathematics?

Yes No

(b). Specify them

.....
.....

8(a). What do you think your students like about mathematics?

The teaching The teacher The subject content

Any other specify

.....
.....

(b) What reasons could you attribute to your answer above?

.....
.....
.....

9. How can students be encouraged to like mathematics?

.....
.....
.....
.....
.....

10. When your students show a negative attitude towards mathematics how do you motivate them?

.....

11. What do you think are the causes of low pass rate in mathematics?

.....

SECTION C: METHODS OF TEACHING MATHEMATICS

The following are different methods used to teach mathematics that may enhance learning of mathematics. Show by indicating against each method how frequent you use it. Rating of the method preferred is as follows Never (N), Sometimes (S), Often (O), Very often (VO), Always (A)

Teaching methods	N	S	O	VO	A
Lecture method					
Small group discussion					
Student demonstrating to one another (or to others)					
Teacher assisting individual student					
Question & and Answer					

1. Any other, specify how frequent:

.....

2. Which of the above methods do you think enhance learning of mathematics and why?

.....

SECTION D: METHODS USED BY METHEMATICS TEACHERS TO MOTIVATE STUDENTS.

The following are motivation techniques that enhance learning mathematics among students. Show by indicating against each method that you, Strongly agree (SA), Strongly disagree (SD), Neutral (N), Disagree (D), Agree (A)

Rating scale is as follows- SD=1, D=2, N=3, A=4, SA=5.

Techniques of motivation	SD	D	U	A	SA
Reinforcing with positive comments					
Using teaching aids					
Varying teaching methods					
Giving frequent feedback					
Providing individual attention					
Offer incentives to any small progress					
Knowing each student by name					

Any other specify how frequent

.....
.....
1. Give suggestions that you think would improve learning of mathematics among students.

.....
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.....

2. How often do you evaluate the performance of learners in mathematics?
Clarify.

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3. Is your format of your evaluation similar to that of the examination question?

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.....

4. In your view how do you think negative attitudes can be changed to improve learning and performance in mathematics?

.....
.....
.....
.....
.....

THANK YOU HAVE A NICE DAY

APPENDIX C

QUESTIONNAIRES FOR THE HEAD OF DEPARTMENTS (HOD)

The researcher is a registered student at Midlands state university for a bachelor of education degree in mathematics. This research study seeks to unearth the factors influencing negative attitudes to students at secondary school resulting in poor performance at ordinary level. The study is conducted in partial fulfilment of the above degree course. Your contribution is of paramount significance and the finding gathered are for study purpose only.

All information shall be kept confidential and for the sake of anonymity no names must be included in this document. Please carefully read through this document and fill in through the details.

INTERVIEW SCHEDULE FOR THE HEAD OF DEPARTMENT MATHEMATICS

1. What is your gender?
2. What is your teaching experience?
3. What is your academic qualification?
4. Do you have enough resources to enhance students' learning and performance
5. In your view what do you think are the factors contributing to negative attitudes towards students learning mathematics in secondary schools?
6. How are these factors affecting student learning?
7. What can be done to improve students attitude so as to improve pas rate at O level?

Thank you have a nice day