
**A COMPERATIVE STUDY OF ACADEMIC
PERFORMANCE OF GIRLS IN MATHEMATICS: A
CASE OF CHONGWE DISTRICT BASIC AND
COMMUNITYSCHOOLS**

BY

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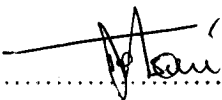
**A dissertation submitted to the University of Zambia in
partial fulfillment of the requirements for the award of the
Degree of Master of Education (Sociology of Education).**



DECLARATION

I Joseph M'soni, declare that this dissertation is my own work and has not been submitted for a degree award at this or any other university.

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CERTIFICATE OF APPROVAL

This dissertation by Joseph M'soni is approved as a partial fulfillment of the requirements for the award of the Master of Education (Sociology of Education) degree of the University of Zambia.

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DEDICATION

This research is dedicated to my children Evelyn, Joackim, Joan, Jonathan, Jocelyn, Josephine, my nieces Brenda and Jane.

I love you all

ACKNOWLEDGEMENTS

I wish to acknowledge my friends and colleagues who kindly read and corrected the manuscript and made suggestions, otherwise it would not have been completed in a satisfactory way.

Special thanks go to Dr. D.M. Sibalwa, my supervisor for his guidance and encouragement during the period that I had been writing this paper. I wish also to extend my sincere gratitude to the Acting Chongwe District Education Board Secretary Mrs. Ngonya H. Mwaanga for allowing me conduct my studies in Chongwe district. It was never easy combining studies and work, but it was their support which gave me the encouragement to complete my studies.

Finally, I wish to sincerely thank my friends, Miss Florence Hanyuma, Michael Mundambo and Batra Kasimbo for their constant support through out my course work.

ABSTRACT

The purpose of the study was to investigate and compare the performance in mathematics of girls from basic and community schools. The study sought the views of teachers on factors perceived to affect girls' performance in mathematics. Teachers also expressed their views through a questionnaire and a mathematics test.

A sample size of 240 Grade 7 girls and twelve Grade 7 teachers from twelve schools participated in the study. All the girls were receiving their education on full time basis in regular classes. Data was collected through a questionnaire, a test and semi-structured interviews. Descriptive statistics were used to come up with percentage charts.

The study revealed that girls from basic schools performed better in the mathematics than those from community schools. The findings further revealed that girls from both basic and community schools did not find difficulties in item tests that dealt with addition and subtraction. However, they had difficulties with items that involved fractions, identifying relationships and problem solving.

The results of the study further indicated that there are similarities and differences in terms of factors that affect girls' performance in mathematics from basic and community schools. For example, both groups disagreed about teachers mostly asking boys to answer questions other than girls. One such difference was that girls from community schools attributed their poor performance to poor teaching, those from basic schools did not.

The results of this study suggest that, as much as girls from basic and community schools come from the same communities, there is a difference in their performance in mathematics. Since the aim of education is to ensure that all pupils excel, factors that affect the performance of girls in mathematics should be carefully considered. Attitudes, rooted in the cultural milieu and reinforced by society, are probably some of the determining factors in whether or not girls succeed in mathematics.

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ACRONYMNS

MoE - Ministry of Education

NGO- Non-Governmental Organisation

ZCSS- Zambia Community Schools Secretariat

FAWE- Forum for Advancement of Women Education

PCSC – Parent Community Schools Committee

CHAPTER ONE

1.0 Introduction

This chapter gives the background of the study. It gives the statement of the problem. The purpose of the study is explained. The chapter also presents questions which guided the study and the significance of the study.

1.1 Background

Education plays a major role in the lives of individuals. The main purpose of education is to provide everybody in community, private and government schools with quality and relevant education. An education that would enable an individual acquire relevant skills, knowledge, attitudes and ideas to lead most fulfilling, productive and satisfying lives. Education is a right for each individual and it is also a means for enhancing the well-being and quality of life for the entire society (MoE, 1996). Every government has, therefore, the responsibility to ensure that it provides an education of good quality to its people in all institutions.

Mathematics is one of the compulsory subjects in schools in Zambia. It is taught in all grades as part of the curriculum and is practically applied in all spheres of our day-to-day existence. Mathematics is considered to be very necessary in Information Communication Technology, insurance, banking and industry. World over, mathematics has contributed to the development of nations through technology. Mathematics is about patterns and structures and these are found in different areas of science and technology. The mathematics of these patterns can be used to explain natural events. According to Porter (1996:151) 'mathematics has a pervasive influence on our everyday life and contributes to the wealth of the country.' Globally, mathematics has been and is still the main

driving force to economic development. It is because of this contribution to development that mathematics has been accorded great value.

The study of mathematics can satisfy a wide range of interests and abilities. It develops the imagination, trains in clear and logical thought. Brenner (1984:71) asserts that:

Mathematics has a continuing drive to simplification, to finding the right concepts and methods to make difficult things easy to explain why a situation must be as it is. In doing so, it develops a range of languages and insights, which may then be applied to make a crucial contribution to our understanding and appreciations of the world and our ability to find and make our way in it.

The study of mathematics, therefore, provides a solid foundation for making many aspects of daily life decisions.

Academic performance in mathematics is one key measure of school success. High performance opens doors to higher education and well paying jobs. For girls to have opportunities in education and in the labour market, it is important to be academically prepared in mathematics. Stipek *et. al.*, (1991:369) noted that “mathematics equips pupils with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways.’ Girls need these skills in order to fit in the labour market.

A number of studies have been conducted in many parts of the world to assess the performance of girls in mathematics. The findings in most of these studies have been that the performance of girls has not been impressive. A number of studies have been done in Zambia to find out the performance of girls in various subjects. Like many studies done

elsewhere, the findings have revealed that girls' performance has not been good in some subjects, especially in mathematics and sciences. However, none of these studies have tried to compare the performance of girls from basic and community schools. It is for this reason that this study compared the performance in mathematics of girls from basic schools and those from community schools.

1.2 Statement of the Problem

Enrolment of girls has increased in both basic and community schools. Mathematics is a compulsory subject from grades 1-7. There have been different opinions expressed over the performance of girls in mathematics. Some parents and education officers at the district level expressed different opinions over the academic performance of girls. Others indicated that girls in basic schools perform better than those in community schools. Teachers in basic and community schools have expressed different views over the performance of girls in mathematics. Some teachers feel that girls in basic schools perform better than those in community schools while others indicate that there is no difference in their performance. However, the academic performance of girls comparatively in basic and community schools is not yet known at grade seven, hence the need for a study.

1.3 Purpose

The purpose of this study was to determine the academic performance of girls in mathematics in basic schools in relation to those in community schools at Grade7 level in Chongwe district.

1.4 Objectives

The objectives of the study were to:

1. assess girls' performance in mathematics in basic and community schools.

2. find out factors that affect girls' performance in mathematics in basic and community schools.
- 3.
4. determine if there is a difference in the attitudes of girls towards mathematics at grade seven level in basic and community schools.

1.5 Research Questions

1. What is the academic performance of Grade seven girls in basic and community schools in mathematics?
2. What factors affect girls' academic performance in mathematics at grade seven level in basic and community schools?
3. What attitudes affect girls' academic performance in mathematics at grade seven level in basic and community schools?

1.6 Significance of the Study

Mathematics is an important subject to one's life. The levels of achievement attained by girls in mathematics should be such that those who leave school function effectively in society, while those who continue in school have an adequate basis for further education. Mathematics is associated with many career opportunities such as in industries and technology.

The study may create better awareness amongst teachers in their ways of teaching. It is also hoped that it will generate information that may be used by the Ministry of Education in the teaching of mathematics in both basic and community schools. It is further hoped that the study would lead to advocacy for girl child education, especially in mathematics. The present study may be helpful in drawing lessons for rural girls' performance in mathematics under similar conditions. The study may be helpful to other researchers and some Non-Governmental organisations (NGOs).

1.7 Theoretical Framework

The theoretical framework applied for the study is the Labelling Theory. Howard Becker (1963), is one of the sociologists mostly associated with the labelling theory. He was concerned about showing how deviant identities are produced through labelling rather than through deviant motivations or behaviours. According to Becker (1966), deviant behaviour is behaviour that people so label. He argued that deviance is created by society, in the sense that social groups create deviance by making the rules whose infraction constitutes deviance and by applying those rules to particular persons and labelling them as outsiders. The theory is concerned with how the self-identity and behaviour of individuals may be determined or influenced by the terms used to describe or classify them. It is associated with the concept of self fulfilling prophesy and stereotyping.

Labelling theory is one of the approaches that have been used to understand what happens in the classroom. Labelling not only affects how others see an individual but also influence the individual's sense of self. There are mechanisms by which the teacher comes to hold certain expectations of the students and these are operationalised within the classroom so as to produce what the teacher had initially assumed. The origins of teacher expectations have been attributed to such variables as pupil's social class, physical appearance, sex, academic performance and language patterns (Noblit and Polk, 1975). It is important to understand that when a teacher labels a student, the label may have a telling effect on the performance and behaviour of the student not only during his/her school life but even after his/her school life.

This theory is applicable to this study due to the fact that as girls come into school, they are from different back grounds, have different cultural values, different attitudes towards mathematics, and different personal

characteristics. It is through such variables that teachers' expectations are raised. The information the teacher gathers determines the label given to girls and the expectations in terms of performance in mathematics. The label given to girls has a long term effect on their performance in mathematics.

1.7 Definition of Terms

The following keywords have been defined as follows:

Attitudes: a state of readiness and a tendency to act or react in a certain manner when confronted with certain stimuli (Opperheim 1979:105). It can also be defined as a favourable or unfavourable evaluative reaction towards something or someone exhibited in ones belief, feelings or intended behaviour.s

Community School: a community based, owned and managed, learning institution that meets the basic/primary education needs of pupils, who, for a number of reasons cannot enter government schools (ZCSS, 2005: 51).

Community School Teachers: teachers employed by the Parent Community School Committee (PCSC) from within the community who are either trained or not (researcher's definition).

Performance: Actual accomplishment as distinguished from potential ability (Good, 1973:363).

Self-concept: a person's way of perceiving him/herself and may be either positive or negative (Mwamwenda, 1995; 363).

Self-esteem: reflects a person's overall evaluation or appraisal of his or her own worth (researcher's definition).

Self-fulfilling Prophecy: a prediction that directly or indirectly causes itself to become true, by the very terms of the prophecy itself,

due to positive feedback between belief and behaviour (Wilkins, 1976:179).

1.8 Limitation of the study

The scope of the investigation was limited by a number of factors. First, the researcher had an initial plan of covering more institutions as this was one way in which he could collect adequate data. However, due to lack of resources such as time, only a limited number of schools were involved. Second, inadequate funding resulted into a situation where the researcher could not involve many schools in the study.

The study did not draw a large sample of teachers and the Ministry of Education was not consulted on policy issues regarding girls performance in mathematics at grade seven. However, the study did meet the set objectives. Any generalizations of the findings of this study to schools should not therefore, ignore these limitations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The study investigated the performance of girls in mathematics from basic schools and from community schools in Chongwe district. The literature focuses on the performance in mathematics in general as they relate to the learning of mathematics by girls. It also considers the general view of this relationship from various types of literature including that which compares boys, and girls, performance in mathematics in some cases. In the writer's opinion, an examination of these factors also provide an understanding of the nature of circumstances that affect the performance of girls in mathematics in both basic and community schools.

2.1 Performance of Girls in Mathematics

The study of mathematics is important, especially in basic and community schools. For example, a good background or proficiency in mathematics will present opportunities in the selection of fields of study in high schools and colleges. The academic performance in mathematics at lower grades in basic and community schools has a bearing as a pupil progress to higher grades. MoE (1996:54) notes that 'the difficulties of many pupils with mathematics and science go back to the way they were introduced to these areas in primary school'. For proficiency in mathematics at the upper basic, high school and college levels, a good background in mathematics is indispensable. Academic performance in mathematics is a key measure of school success because high performance opens doors to different stages of education and to well paying jobs.

The value of mathematics has also been acknowledged by a large number of people who use it in their work. These people stress the great value of the practical aspect of the subject such as shopping, agriculture, and medicine as all these involve mathematics. According to Gill (1994:56) , 'mathematics is present anywhere in modern civilisation and the efficiency of industrial or scientific research is even based more on the mathematical background of the individual working in any scientific or technological environment.' For this reason without knowledge in mathematics, it is impossible to stay on top of the scientific and technological progress. It is the value of something that builds attitudes of an individual towards that thing. In this case, a girl's value of mathematics depends on her perception and attitudes towards the subject.

In Zambia, mathematics is a subject in which girls have generally performed poorly. Many do not want to continue learning it at higher levels. Despite government and other stakeholder's attempts to improve girls' performance in mathematics and to encourage them to study mathematics, very little, if any, improvement in girls' performance in mathematics has been recorded.

Research has been done to find out the academic performance of girls in mathematics and significantly interesting results have been found in these studies. Different factors have been considered in these researches that have contributed to the academic performance of girls. Although findings vary among primary and secondary school students, several conclusions have been made. Most literature has concluded that there are several factors that affect girls in mathematics achievement at some point in their school progressions.

Fennema (1974), Maccoby & Jacklin (1974) showed that girl's achievement levels decrease at some point in their schooling as they progress in age. It was found that girls reported lower performance in mathematics during middle and late adolescence but not between the ages of eight and eleven. Studies have also been conducted to determine areas where girls' performance was poor in mathematics. Flanagan (1982), and Fox man et. al., (1980), observed that girls' performance was poor in assessments of achievements in some mathematical skills or knowledge such as application of numbers, rate and ratio while their performance was better in computation skills as comparable in other areas tested. Hyde (2005), noted that well before high school, girls should be taught essential problem-solving skills in conjunction with computation. It was also noted that girls should have more access to problem-solving experiences outside the mathematics class as this may help them improve in their performance.

It has been widely demonstrated for instance, by Badger (1981), and Armstrong (1980), that until adolescence, girls show no more difference in mathematics achievement than they show in general intelligence as their scores are comparable. However, Badger and Armstrong observed that in their early teens, girls' performance begins to decline until by the end of compulsory schooling. The major discrepancies in performance in mathematics of girls arise in two general areas, namely spartial ability and judgment. The other involves the recall, combination and application of relevant knowledge to a problem which is often termed as problem-solving (Badger, 1981).

In contrast to the above findings, Brandonet et. al., (1987), reported that differences in mathematics achievement in Hawaii indicated that girls have had positive performance in mathematics. The findings showed that the positive performance of girls was found as early as grade four, which

was the earliest grade examined in the study, and this increased as the grade levels also increased. These results were in support of previous Hawaii studies that indicated Hawaii girls' good performance in mathematics. They also observed that girls performance in mathematics world wide vary by ethnicity.

2.2 Factors Affecting Performance of Girls in Mathematics

Researchers have brought out different factors that have contributed to girls' academic performance in mathematics. Among these factors were biological, anxiety, attitudes, influence of culture and influence of classroom interaction. Studies conducted in Zambia have identified similar factors to the ones reported above. These included negative values and attitudes towards mathematics, unfair division of labour in the home, low parents and teachers expectations on pupils, especially girls (Maimbolwa-Sinyangwe & Chilangwa 1995).

2.2.1 Classroom Interaction

A number of educational researchers have shown that in mixed-sex classrooms girls seldom participate in discussions and thus are given less attention by the teachers.). At classroom level, researchers have mainly investigated the nature of classroom interaction to try and find causes of low motivation, poor participation and performance of girls in mathematics. Brophy & Good (1970), Sykes & Brophy (1972), all agree that girls' participation in classroom activities to be poorer. Spender (1992), reviewing research on the subject cited several studies which reported that girls talked less, answered, and asked fewer questions during mathematics lessons. However, Croll (1985), observed that although most studies support the conclusion that boys receive more teacher attention than girls, the results have not been uniform, particularly with regard to the magnitude of the differences observed. An American research concluded that the differences between boys and girls

with regard to teacher attention were smaller than earlier studies suggested.

A number of studies on classroom interaction in education have shown that in mixed-sex classrooms compared to single-sex classrooms, girls received less teacher attention and took a less prominent part in discussions, which affected their performance negatively. Although most studies supported the conclusion, the results were not uniform. American research conducted by Good, et. al., (1980), concluded that teachers gave girls little attention in class. They also noted that teacher interaction had a strong bearing towards girls' performance in mathematics. As Girls needed support from their teachers to encourage them to use the time they need to understand concepts and to formulate their own foundations of mathematical thinking. They reported that this was missing in many classrooms.

Different British studies have also presented different estimates of the degree of imbalance in the levels of teacher attention given to girls. A study of the extent to which boys Vs girls call out answers to questions which teachers pose to the class, concluded that boys called out answers more frequently than girls (Kleinfeld, 1998). The report further says that teachers' typical reaction to boys was to listen to the comment, while girls were usually told to raise their hands if they wanted to speak. Spender (1982), claimed that sometimes even when teachers are trying to give equal attention, girls get only over a third of the time teachers spend with pupils in terms of attention they receive from teachers. Spender further found that girls, especially in junior secondary years were reluctant to express their points of view in class as they were not recognised by teachers. Gavin and Reis (2004), observed that, if girls are to perform in mathematics, teachers should create a classroom environment that will help girls develop mathematical abilities. This

environment should nurture, create thinking and encourage risk taking among girls.

Girls' interactions vary according to the age of pupils. In the lower grades there is not much difference in the interaction between teachers and both boys and girls during mathematics lessons. In a research conducted by Maimbolwa-Sinyangwe and Chilangwa (1995), in Zambia, they observed that girls were generally found to interact less with teachers than the boys. This was particularly true in rural schools in Chipata where boys were invited to answer questions even when they did not raise their hands whilst girls who had raised their hands were ignored. Although their findings presented an overall picture that favoured boys in classroom interaction, there were cases where this situation was not observed. Maimbolwa-Sinyangwe and Chilangwa noted that in Lusaka schools, at grade four levels in particular, girls tended to answer questions more frequently than boys. Grade four girls even in rural schools were also observed to participate actively in classroom activities than boys. The reverse in performance they observed, seemed to begin at upper primary school.

In an attempt to isolate features that may affect girls' performance, some studies used recording schedules to quantify the interaction between teachers and students within secondary school mathematics classes in the United States (Stallings, 1979; Becker, 1981). Both studies concurred that the larger amount of teacher-initiated interaction in mathematics classes was not directed towards girls. For instance, Becker noted that although girls initiated all types of teacher contact to a greater extent than boys, teachers initiated a significantly larger number of their contacts with boys. This, she suggested was indicative of the teachers' greater discouragement of girls in their academic pursuits in mathematics. During the period of observation, boys received seventy

per-cent of positive contacts while girls received eighty-three per-cent of non encouraging or discouraging comments. In the same research, teachers also showed more persistence with boys and gave a greater amount of individual help. On the other hand, when asked for self-report, teachers seldom expressed or showed consciousness of sex bias in the perception of pupils.

A Sub-Sahara Africa research on classroom interaction revealed a treatment of girls which affected their performance in mathematics negatively. Odaga and Hereveld (1995), reported findings where teachers paid less attention to girls in Kenya, Malawi and Rwanda. In a study in Cameroon, Kilo (1994), reported that teachers acknowledged that they did not prefer to teach girls mathematics because they did not pay much attention in class. The distressing picture of girls' poor performance in mathematics and subsequent inadequacy in this area points to deficiencies at the classroom level. The deficiency may be in the facilities, the resources or the teaching methodologies and teachers' attitudes. It may be in the expectations that pupils set for themselves and that others entertain for them, since these are known to have a major impact on students' performance. According to MoE (2007:12):

Most Community school teachers have been volunteers, do not have teaching qualifications and may not have completed grade 12. In some schools grade seven school leavers are teaching. As a result of poor qualifications, many community school teachers have not been able to apply basic teaching skills in their classrooms.

In Zambia, studies investigating the performance of girls have attributed poor interaction from teachers, among other things to biased learning materials, biased curriculum and poor teacher qualifications and parental expectation of the girl child (Tembo, 1994; Kelly, 1995).

There are certain behavioural patterns that characterize girls approach to mathematics. One is their tendency to keep to specific methods that have been approved by their teachers. There is also apparent blindness to the real world significance of some of the mathematical problems. Woods (2005), noted that there is girls' consistent failure to follow a problem through to its conclusion. That is, when problems involve a number of steps to get the solution, girls are more likely to stop at the first stage. All these types of behaviours have relevance to number applications or problem solving and may offer some explanation for girls' poor performance.

2.2.2 Girls Attitudes towards Mathematics

Another factor that is of great importance in learning mathematics is the attitudes of learners towards mathematics. This is because attitudes play an essential role in determining learner behaviour towards mathematics. Opperhim (1979:105), defines attitudes as 'a state of readiness and a tendency to act or react in a certain manner when confronted with certain stimuli.' In accordance with this definition, one could define attitude as an individual's behaviour towards mathematics.

Mathematics appears to be unpopular as a high school subject (Bank, 1976; Evrest, 1976). Many girls in secondary school seem to have unfavourable attitudes toward mathematics. This negative attitude sometimes begins in lower grades as their foundation in mathematics is usually poor. According to Aiken (1976), this attitude explains the gender difference in mathematics achievement that was found to favour males in many studies. Zekele (2000), observed that girls' poor mathematics achievements and attitude were prominent at the 7th, 9th, 10th and 11th grade levels. Zekele's finding generally suggested that these negative attitudes at these grade levels contributed greatly to their performance in mathematics. Neale (1969), therefore suggested that mathematics

achievement and attitude towards mathematics influence each other positively.

Mathematics is not easy to learn for most people as it is also true that mathematics becomes harder from lower to higher grades. As a result of this and perhaps other factors, girls' attitudes toward mathematics become increasingly less favourable as they progress to higher grades. Girls have positive attitudes toward school but negative attitudes towards mathematics. This means that students would exert increasingly less effort in learning or studying the subject, the result being that their mathematics achievement would become lower. In his research Swetman (1995), noted that girls' positive attitudes towards mathematics decline as they grow older. Initially girls have more positive attitudes towards mathematics than boys. As they continue in school, girls' attitudes become more negative. Thus, the influence of attitude on mathematics achievement may be expected to increase from lower to higher grades. The results of Zekele (2000), further suggested that there existed other variables, besides students' attitude. Other effective variables such as peer-group expectations were found to affect girls' attitudes towards mathematics and their achievement. From the results, both females and males (in grades eight to eleven) thought males do better in mathematics.

The importance of attitudes in the learning of mathematics is further emphasised by Harlen (1997:39), who stated that 'pupils' attitudes affect the willingness of individuals to take part in certain activities, and the way in which they respond to persons, objects or situations.' This shows that learners will only understand or be ready to learn new concepts in mathematics if they are willing and are ready to learn. Girls' attitudes to mathematics serve as a predictor of their performance in mathematics.

A further longitudinal study of 13-year olds found that from ages thirteen to fifteen girls showed more and deeper declines in their attitudes toward mathematics (Sherman, 1980). In grade seven the only significant sex-related difference in attitude was girls' stronger denial that mathematics was a male domain. From seventh grade upwards, girls were significantly less confident of themselves as learners of mathematics. They regarded mathematics as useful, but continued to regard it as more of a male domain. A large study in England was also conducted by Preece and Sturgeon (1980), assessed attitudes toward mathematics among approximately 2500 boys and girls aged ten to fifteen. They indicated that, in general, many of the same patterns of attitude that have been reported in countries like United States can be found in England. For example, where as positive attitudes towards mathematics generally declined among all pupils, the drop was more dramatic in the case of girls.

From these and similar studies, Stallings (1979), and Brush (1979), noted that one of the most significant factor that affected girls performance was the lower estimation of their own ability. They also observed that there is some indication that a girl's relative failure in mathematics is related to their acceptance to regard mathematics as a masculine intellectual domain.

2.2.3 Teachers and Parents Attitudes

Teachers may contribute to girls' poor performance in mathematics by giving them less attention during class. Girls' low participation and negative attitudes towards mathematics is greatly affected by teachers' attitudes. Girls internalise their teachers and parents negative expectations which become self-fulfilling prophecies. Because girls believe that they can not achieve in mathematics, they do not achieve in mathematics. According to Jenipher (1995:97), 'girls' poor performance

reinforces parents and teachers negative attitudes, expectations and feeds the cycle of negative expectations and lack of achievement.' The research concluded that parents and teachers beliefs about the girls could clearly be detrimental to girls' belief about mathematics and their performance in mathematics. A number of reasons have been given for this kind of performance by girls. In their research findings, Schwartz & Wendy (1992:37) noted that;

Teachers must consider girls mental and physical development and the effect of their own attitudes and behaviours on girls' participation and performance in mathematics. When girls begin to mature, they focus more on other activities and less on their intellectual abilities. As a result self-esteem decreases, their performance affected and therefore, teachers should build positive attitudes towards girls.

Teachers and parents attitudes can affect girls performance positively or negatively.

2.2.4 Cultural Factors

Certain cultural norms and beliefs are some of the factors that do contribute to the prevailing poor performance of girls in mathematics. The work that girls do at home before and after school is important. The amount of work given to girls has a bearing on their level of concentration. Work after school would impact negatively on the girls' ability to do their homework. According to FAWE (1997), there is prevailing cultural expectation, norms and traditional attitudes that restrict girls' mobility and opportunities. Like wise, the amount of time girls are required to spend on domestic tasks and other productive activities reduces the time and energy they have to spend in school and on school work. This affects their attendance and performance. Notably, what household chores are mostly done by girls and this has been

associated with girls' poor performance in school. The impact of work on pupils was examined by MoE (2006), who found that there was no relationship between the frequencies of work done at home before with performance at school. The findings however indicated that giving chores to girls before going to school does not affect learning achievement but giving work to girls after school lowers their learning achievement.

In a research conducted by Fennema and Sherman (1978), pupils were asked not only about their perception of mathematics as useful, but the extent to which they saw their parents as supportive of their mathematics and also the extent to which they believed that mathematics was a male domain. They found out that from grade eight to eleven, boys showed a consistently greater degree of self-confidence in their ability to learn mathematics than did girls. Girls were significantly less self-confident. Their performance tended to confirm the influence of the variable of self-confidence on performance.

Another cause that has been cited to be the cause of girls' poor performance in mathematics is the cultural gender stereotype. Society deems that mathematics, science and mechanical activities are the province of males, whereas literature, languages and social studies are the province of females. Teachers and parents believe that boys are better at mathematics than girls. These judgments are reflected in the amount of effort expended by girls in mathematics. It is not surprising, therefore, that adolescent girls pursue mathematical studies to a lesser extent and are not successful (Narsh 1979). Narsh noted that the salience of the feminine or masculine role varies with individuals so that the value of any task reflects not only society's judgment of sexual appropriate but also the reaction of the individuals towards such judgments.

Stein Pohly and Mueller (1971), in their research found that labelling tasks as masculine or feminine influenced the importance attached to success on the tasks and the expectance of success for both boys and girls. They also found that the expectance and performance of boys was influenced more strongly and consistently than girls. This also was confirmed by Dwyer (1974), in a study of children from grade two to twelve. Dwyer reported that the extent to which interests and activities were labeled as masculine or feminine contributed significant variance arithmetic scores for girls.

Research carried out by Zekele (2000), in Ethiopia showed that girls' lower performance in mathematics was observed as early as the eighth grade. The findings suggested that eighth grade girls' lower performance in mathematics was not attributable to their attitudes towards the subject. This was more so because girls appeared to have a favorable attitude towards mathematics at the eighth grade level. An explanation for this finding lay in the local culture which generally discouraged the education of girls (Seyoun, 1986). He further noted that girls' lower performance in mathematics was related to their life style. Most girls in the rural areas were responsible for household chores such as cooking, taking care of young siblings or helping their over-burdened mothers. This left them very little time to study both at school and home. This explanation was supported by a cross-national study, (Garden, 1987), which disclosed that time spent on homework was an important predictor of mathematics achievement. Most girls were denied of such time at their homes due to the chores they had to carry out.

Studies in Hawaii have suggested socio-cultural reasons for Hawaii girls being higher achievers (Bartos & Kalish, 1961; Kitono, 1962 & Smith, 1976). Brenner (1984), found that girls performed well in culturally compatible curriculum for children of Hawaiian descent. These findings

tentatively indicated that the interaction between curriculum and ethnicity may have affected girls' achievement motivation. Research in several countries shows that societies define mathematics as a male subject and expect better performance in that field from boys than girls (Warwick & Jatol, 1994). They also noted that girls believe that they have less skills with numbers, and that teachers use classroom practices in mathematics that do not help female students. 'Therefore girls see little usefulness for mathematics in their lives. Fox (1988), observed that in Pakistan, as in other countries, mathematics was considered as a male domain. For example, 1987 data on postgraduate enrollment in all the Pakistan's universities showed that women accounted for only six per-cent of the master's candidates in mathematics compared to seventy-one per-cent for men.

2.2.5 Self-concept

Self-concept develops from childhood through adulthood as a result of a person's interaction with his/her environment. The interaction includes peers, parents, teachers and the various tasks and responsibilities he/she is assigned and the way he/she copes with them. Mwamwenda (1996:363), demonstrated that 'whether a person develops a positive or negative self-concept depends on how he/she is treated and how he/she perceives such treatment'. Numerous studies linking self-concept and academic achievement in subjects such as mathematics have been conducted in Africa and elsewhere.

Omizo *et. al.*, (1981), carried a study with a sample of 296 Mexican-American standard seven students. The purpose of the study was to relate students' self-concept and their performance in total mathematics (mathematical concepts, application and computational skills). The study showed that female subjects had a low level of self-concept, and that performance on the tasks was linked with a negative self-concept. A

pupil with a positive self-concept stands a better chance of performing better than a pupil with a negative self-concept. Omizo argued that pupils who enjoy mathematics are likely to spend more time and energy gaining mastery of the subject. As a result they are reinforced by the success they achieve, which in turn continues to reinforce them to perform well in mathematics. With increasing task difficulty, self-concept is reduced while in easy tasks, an in routinizing well defined procedural tasks self-concept is enhanced amongst girls. They found that the relationship between self-concept and academic performance was less among girls. On the other hand, other studies have observed no differences in the level self-concept in girls (Marsh, Relich & Smith 1983; Ezeilo 1963). Marsh et. al., pointed out that in single sex schools no significant difference was observed among girls, whereas in co-educational schools, sex differences are accentuated in the direction of traditional sexual stereotypes. In his study of female Nigerian secondary and tertiary students, Ezeilo (1983), observed that female subjects' self-concepts were positive even in mathematics. In South Africa, Mwamwenda (1991), examined sex differences in self-concept among black African adolescents' secondary school pupils. The results showed that there was no significant difference between boys' and girls' self-concepts.

A study conducted by Wolf and Blix (1981), on girls drawn from standards one to eight, showed that their attitude towards mathematics served as a predictor of their performance in mathematics. Central to this finding was self-concept in the sense that a girl with a positive self-concept was more likely to have a positive attitude towards mathematics, which was to lead to good performance. Wolf and Blix observed that achievement in mathematics was determined by one's attitude being determined by one's achievement in the subject. Self-concept is a moderator and possibly a cause of academic achievement. In Uganda,

Heinemann (1979), hypothesised that a child who felt more confident and more self-assured would perform better in mathematics. Heinemann therefore, holds the view that in Uganda academic performance of girls in mathematics suffers due to pupils' lack of confidence and not due to their impoverished backgrounds. He also observed that a change in self-concept by girls also precipitated a similar change in academic performance in mathematics.

2.2.6 Conclusion

In conclusion, studies reviewed show that there are many factors that contribute to poor performance of girls in mathematics. It is important that with such a situation girls develop lower expectations for themselves in mathematics and girls believe they do not have mathematical ability. When girls do poorly in mathematics, they attribute their poor performance to their inability to do mathematics.

CHAPTER THREE

METHODOLOGY

3.0. Introduction

The purpose of this chapter is to show how the study was conducted. This chapter looks at the sampling frame, sample size and sampling method used. The chapter also looks at the type of data collected and their sources. It looks at data collection instruments used and methods of administration, analysis techniques used and finally it looks at the limitations of the study. Chongwe District has fifty-four (54) basic and forty-six (46) community schools. The schools were sampled on the basis of having enrolment of girls at the grade seven level as some community schools did not have.

3.1. Research Design

According to Churchill (1987), a research design is simply the framework for a study used as a guide in collecting and analysing data. It is a blue print that is critically followed in completing a study. The purpose of this study being determining the academic performance of girls in mathematics in basic schools in relation to those in community schools at grade seven level, a descriptive research design was used. The study used qualitative and quantitative approaches.

3.3 Target Population

The target population of the study consisted of ten basic and ten community schools, twenty grade seven teachers (ten basic and ten community schools) and 400 grade seven girls from both basic and community schools in Chongwe district.

3.3 Sample Size

In this research, the sample was modified so that time and other resource hindrances are taken into account. The study used a sample of six basic and six community schools with each school providing twenty grade seven girls, one grade seven class teacher and a school manager. The total sample size for the study was two hundred and forty grade seven girls, and twelve grade seven class teachers.

3.4 Sampling Procedure

The sample for this study was selected using two sampling techniques. The six basic schools, six community schools and grade seven teachers were selected using the purposive sampling technique while the girls to participate in the study were selected by simple random sampling technique.

Purposive sampling technique was used to select the twelve grade seven teachers as many of the basic and community schools in Chongwe district had one stream at grade seven level. Out of the twelve grade seven teachers who were interviewed 58.3% (7) were males while 41.7% (5) were females.

The classes of grade seven pupils with girls from the twelve schools were selected by simple random sampling in schools where a class had less than twenty girls in a grade seven class, all of them were selected and included in the sample. In case of schools which had more than one grade seven class, all the girls in the relevant classes were listed and simple random sampling technique was utilized. Yes and No responses were written on small pieces of paper. The small pieces of papers were put in a box and each pupil was requested to pick one paper. All those who picked papers with Yes written on them participated in the research.

3.5 Types and Sources of Data

In an attempt to come up with a thorough study, both primary and secondary data were collected.

(i) Primary Data

According to Churchill (1987), primary data is originated by the research for purposes of the investigation at hand. This was mainly obtained by using questionnaires, focus group discussions and observations by the researcher. The questionnaires were pre-tested to test their simplicity and whether they would capture the desired information.

(ii) Secondary Data

This was mainly collected from the published and unpublished literature within the objectives and from various journals and research papers particularly available on the internet. Bulk of the information was also sourced from the Ministry of Education and School documents such as class registers.

3.6 Research Instruments

Interview guides, questionnaires and a mathematics test were used to gather information. The interview guides were used to collect qualitative data while questionnaires and a test in mathematics for quantitative data. In addition, an informal discussion list was used to gather more information for analysis.

3.7 Objectivity, Reliability and Validity

In order to ensure that the issues of objectivity, reliability and validity were taken care of, the respondents were allowed to express their views without interference. This was done face-to-face and confidentiality was maintained.

To ensure reliability, the questionnaire and the mathematics test were piloted. The test items were constructed based on the grade seven syllabus with the assistance of four grade seven teachers, two from basic and two from community schools. These schools were not included in the research. After the mathematics test was constructed, it was administered to four pilot schools (two basic, two community schools). The same procedure was followed with the questionnaire.

3.8 Data Collection

Field data collection using the developed instruments was undertaken as follows:

3.8.1 Informing the School Head

The Heads of the sampled schools were informed some days in advance of the classes selected for the interviews. They got no information on the content of the questionnaires. It was sufficient to inform them that the study was about mathematics performance of girls and explained in detail how the day in their respective schools would be organised.

The teachers got to know the questionnaire only at the end of the data collection process. This was aimed at avoiding briefing of pupils by school personnel. They were asked to prepare a classroom to ensure that there was enough space for the administration of instruments without being hindered by the neighbour. Therefore, there was one girl per desk.

3.8.2 Conducting Interviews in School

On the day of the interview, teachers were asked to leave the room/place to avoid possible interference. The researcher circulated enough material to make sure that the girls were not disturbed and did not lack any material required.

3.8.3 Introductory Statement

A simple introductory speech meant to arouse pupils' interest was of utmost importance. In this statement, the objective of the research was given and pupils understood that completing the questionnaire was in their own interest, and that they did not have anything to gain if they cheated. The fact that names were not filled in helped to explain the anonymity of the procedure. The pupils were encouraged to fill in discreetly so that the neighbour could not observe.

3.8.4 Administering the Questionnaire.

A questionnaire enlarged to poster size was very helpful. It was presented page by page, read aloud, and filled in by the participants at the same pace. In cases where somebody did not understand, a question was read again and translated into a local language where necessary. The researcher also allowed where possible, the pupils to ask for discrete individual help. After passing through all questions, pupils were asked to check for completeness and to put their questionnaires in a box. At the end participants were thanked for their collaboration and a pen used by each participant was given as an incentive.

3.8.5 Administering the Mathematics Test

The mathematics test was also administered to grade seven girls only. The test was administered by the researcher at each school. The girls were requested to answer all questions and adequate time was given.

3.9 Data Analysis

Analysis of data was done both by using qualitative and quantitative methods. The data gathered from the questionnaire and mathematics test were analysed using the Statistical Package for Social Sciences (SPSS). This summarised responses for analysis. Responses from the

questionnaire were coded and summarised into cross tabulation tables which were used to generate charts and percentages by use of the SPSS. The same was done for the mathematics test. Responses from the interview were summarised to come up with emerging themes and patterns.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.0 Introduction

This chapter presents the findings of the study. The study results of the investigation are presented under the following subheadings; performance in mathematics in basic and community schools, factors that affect girls' performance in mathematics and issues of attitudes of girls towards mathematics at grade seven level. The findings presented in this chapter are responses from both pupils and teachers. Responses from the focus group discussions and data from the analysis of school records such as class registers and report forms are also presented.

4.1 General Performance of Girls in Mathematics

Evaluation of the pupil performance in mathematics was assessed by administering a similar test in both basic and community schools. The test was aimed at comparing the actual levels of performance item by item according to the domains of knowledge which included fractions, comprehension, knowledge levels and conversion of units between grade seven girls in basic schools and community schools. A mathematics performance assessment test was administered to a total of 210 girls instead of 240 girls from both basic and community schools due to the fact that some schools could not provide the required number. Results show that 47% failed from both basic and community schools (Table 4.1.1).

Table 4.1.1 General Performance of Girls in the Mathematics Test

Type of school	Passed	Failed	Total
Basic	79	34	113
Community	33	64	97
Total	112	98	210

From the above results out of 113 girls who sat for the test from basic schools, 70% (79) passed while 30% (34) failed. In community schools ninety-seven sat for the test and 34% (33) passed while 66% (64) failed.

4.1.2 Performance on Computations (addition and subtraction)

Both basic and community schools grade seven girls were assessed on their performance levels on computations (i.e. addition and subtraction) in mathematics by way of getting the correct or wrong answer. The results are presented in the table below.

Table 4.1.2 Performance on computations

Type of school	Correct answer	Wrong answer	Total
Basic	103	10	113
Community	79	18	97
Total	182	28	210

The above results show that out of 113 girls who sat for the test from basic schools, 91.2% (103) passed while 8.8% (10) failed on this test item. In community schools ninety-seven sat for the test and 81.4% (79) passed and 18.6% (18) failed on this test item.

4.1.3 Performance on Multiplication

Girls' performance on multiplication was assessed. The results are presented in Table 4.1.3 below.

Table 4.1.3 Performance on mathematics

Type of school	Correct answer	Wrong answer	Total
Basic	93	20	113
Community	72	25	97
Total	165	45	210

From the above results, out of 113 respondents from basic schools, 82% (93) got the question correct while 18% (20) got it wrong. In community schools out of ninety-seven respondents 74% (72) got the item correct while 28% (25) got it wrong.

4.1.4 Performance on Fractions

Respondents were assessed on their knowledge in fractions. Results are presented in Table 4.1.4.

Table 4.1.4 Performance on Fractions

Type of school	Correct answer	Wrong answer	Total
Basic	37	76	113
Community	27	69	97
Total	64	145	210

There were 113 respondents from basic schools of which 67.3% (76) got the question wrong while 32.7% (37) got it correct. Out of ninety-seven respondents from community schools, 71.1% (69) got it wrong while 27.8% (27) had it right.

4.1.5 Performance on identifying relationships (Number Patterns)

Identifying relationships or number patterns is a requirement in mathematics and respondents were asked if they were able to identify number relationships or patterns. Results are presented in Table 4.1.5.

Table 4.1.5 Performance on Identifying Number Patterns

Type of school	Correct answer	Wrong answer	Total
Basic	7	106	113
Community	27	70	97
Total	34	176	210

Results from basic schools show that out of 113 respondents 93.8% (106) got the wrong answers and 6.2% (7), got the correct answers. From community schools, out of ninety-seven respondents, 72.2% (70) got it wrong while 27.8% (27) got correct answer

4.1.6 Performance on Converting Grams into Kilograms

In order to assess knowledge levels in conversions, respondents were asked to convert grams of some measure to kilograms. Results are as shown in Table 4.1.6 below.

Table 4.1.6: Performance on converting grams into kilograms

Type of school	Correct answer	Wrong answer	Total
Basic	21	92	113
Community	23	74	97
Total	44	166	210

The above results show that out of 113 respondents from basic schools 81.4% (92) got the question wrong while 18.6% (21) got the correct answer. In community schools out of ninety-seven respondents, 76.2% (74) got the wrong answer while 22.7% (23) got the correct answer.

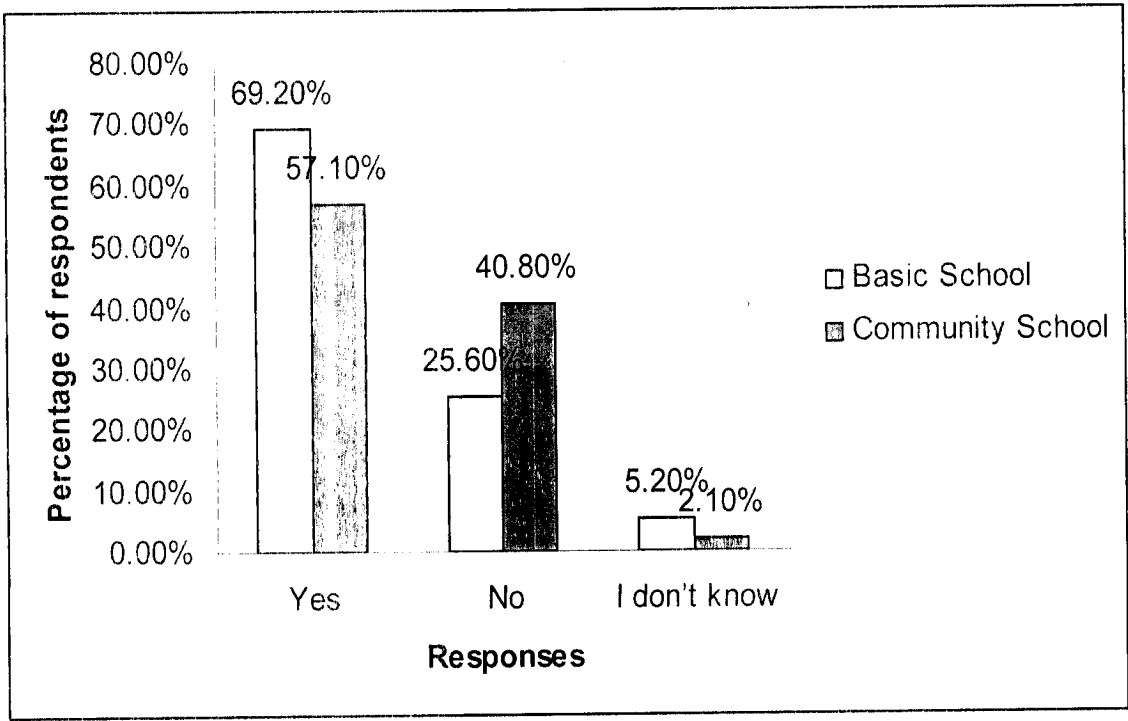
4.2 Factors Affecting Girls' Performance in Mathematics

In this section, we present the factors that affect girls performance in mathematics at grade seven which include; classroom interaction, teacher attitude, parental attitudes, self concepts and cultural issues.

4.2.1 Classroom Interaction

Respondents from both basic and community schools were asked if classroom interaction had any effect on the performance of girls in mathematics. Findings are presented below (Figure 4.2.1).

Figure 4.2.1: Classroom Interaction Affects Performance in Mathematics

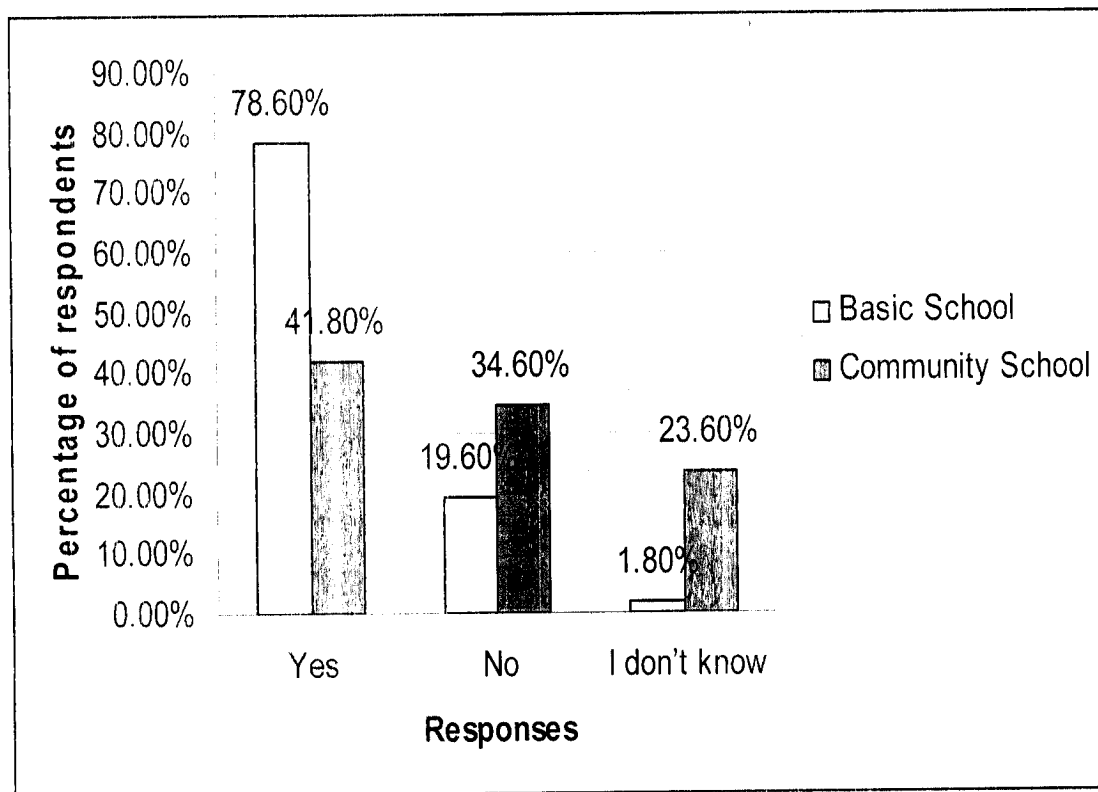


The above results show that out of 113 respondents from basic schools 69.2% agreed compared to 25.6% who disagreed while 5.2% did not know. From community schools, out of ninety-seven respondents 57.1% agreed and 40.8% disagreed while 2.1% did not know.

4.2.2 Teacher Attitude

Respondents were asked if teachers' attitudes affect girls' performance in mathematics in both basic and community schools. Results are presented in Figure 4.2.2.

Figure 4.2.2: Teacher Attitude affecting Girls' Performance in Mathematics

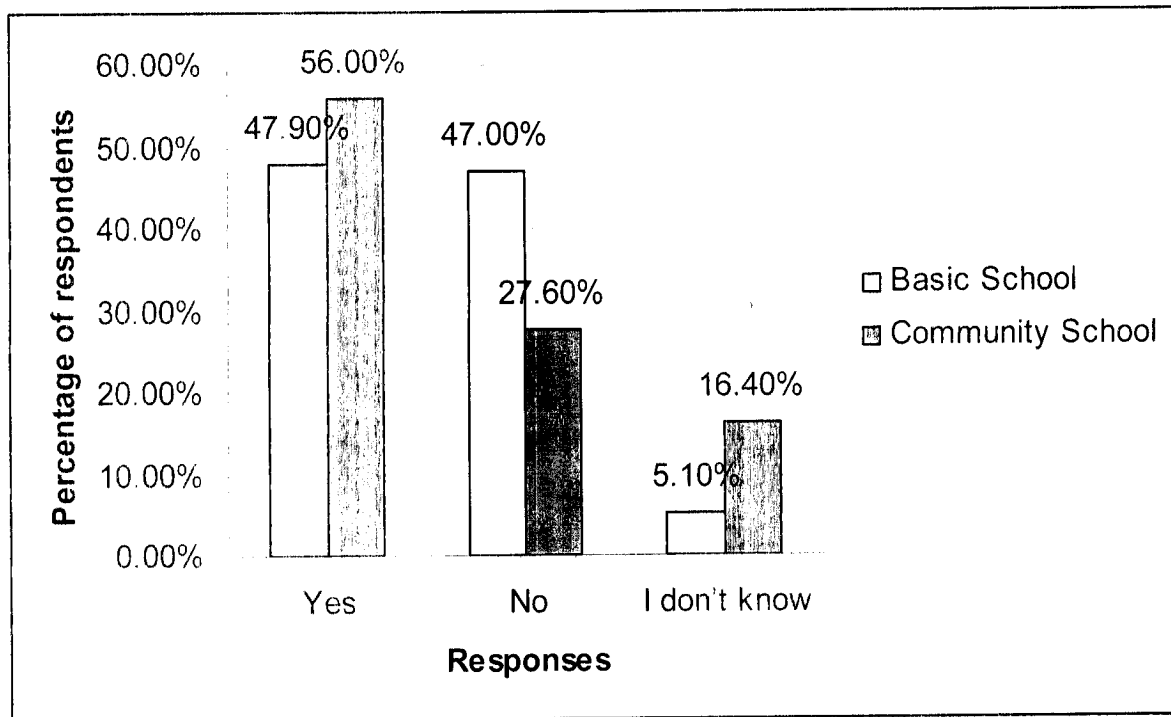


Overall results indicate that at basic school level, out of 113 respondents 69.2% agreed compared to 25.6% who disagreed while 5.2% did not know. From community schools out of ninety-seven respondents, 57.1% agreed and 40.8% disagreed while 2.1% did not know.

4.2.3 Cultural Factors

Respondents were asked if cultural believes such as girls spending most of their time doing home chores than homework in mathematics have any effect on the performance of girls in mathematics. Results are shown in Figure 4.2.3

Figure 4.2.3: Cultural Factors affecting Girls' Performance in Mathematics



Results from basic schools show that out of 113 respondents, 47.9 % agreed compared to 47.0% who disagreed while 5.1% did not know. From community schools, out of ninety-seven respondents, 56.0% agreed and 27.6% disagreed while 16.4% did not know.

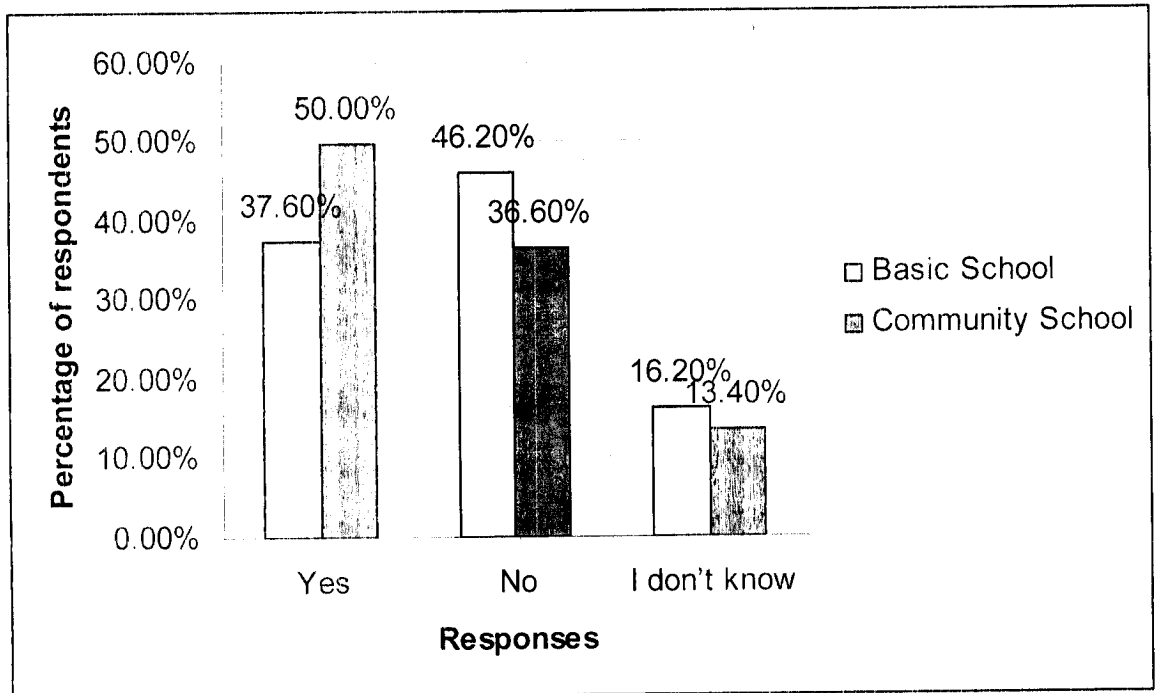
4.3 Attitudes of Girls towards Mathematics

In assessing girls' performance in mathematics at grade seven level, it is important to assess their attitudes towards the subject. This section presents the assessment of both basic and community school grade seven girls' attitudes towards mathematics. The main issues assessed are the preference for other subjects to mathematics, mathematics being considered as a subject for boys and not girls, boys mistreating girls when they fail to answer mathematical questions in class and girls general attitude towards teachers' presentation of mathematics during learning.

4.3.4 Girls Prefer other Subjects to Mathematics

In assessing attitudes of girls towards mathematics, both basic and community school grade seven girls were asked if they preferred other subjects to mathematics. Results are presented in Figure 4.3.4.

Figure 4.3.4: Girls Prefer other Subjects to Mathematics

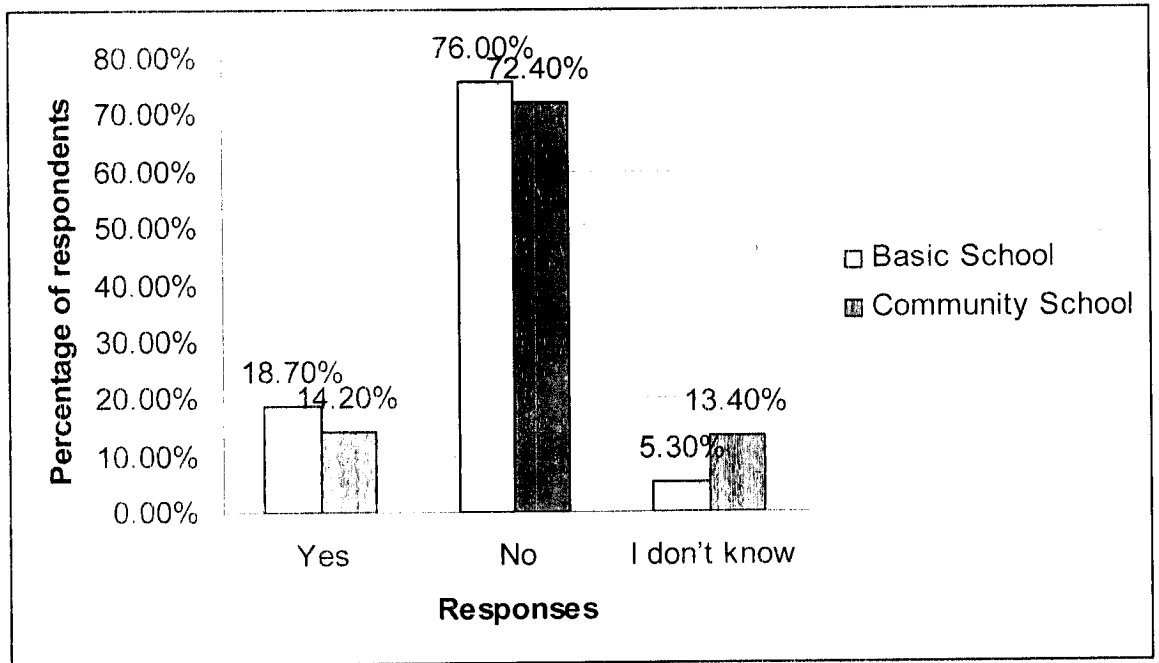


The above results show that out of 113 respondents from basic schools 37.6 % agreed compared to 46.2% who disagreed while 16.2% did not know. From community schools, out of ninety-seven respondents, 50.0% agreed and 36.6% disagreed while 13.4% did not know.

4.3.5. Mathematics is for boys and not girls

Grade seven Girls from basic and community schools were asked as to whether they agreed or not with the notion that mathematics is the subject for boys and not girls. Results are presented in Figure 4.3.5 below.

Figure 4.3.5: Mathematics is for Boys and not Girls

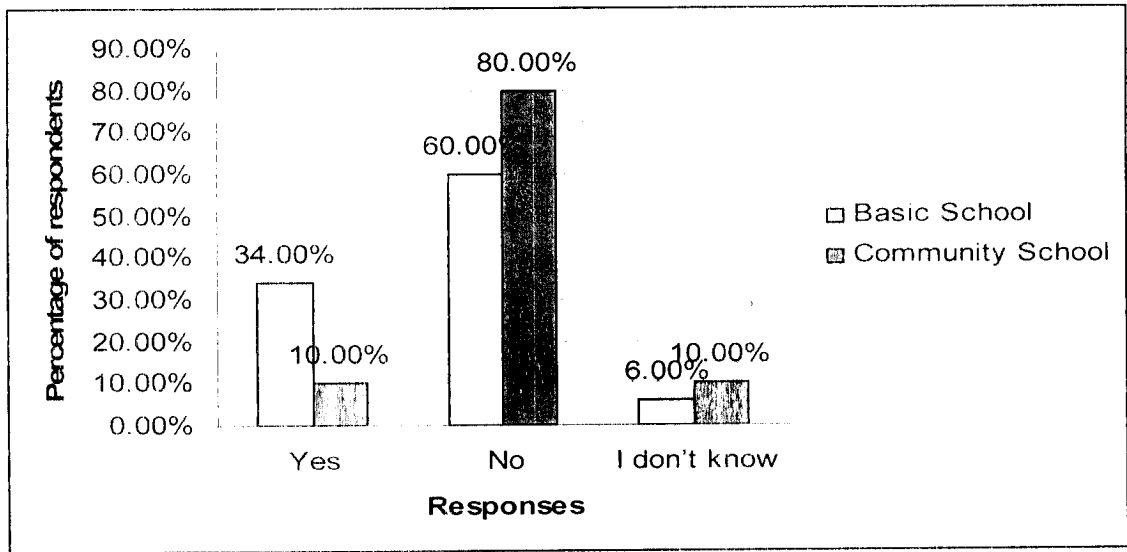


The above results show that out of 113 respondents from basic schools 18.7 % agreed compared to 76.0% who disagreed while 5.3% did not know. From community schools, out of ninety-seven respondents, 14.2% agreed and 72.4% disagreed while 13.4% did not know.

4.3.6 Boys Jeer Girls when they Fail to Solve Mathematics Tasks

Respondents were asked if boys jeer girls in class or outside when girls fail to answer a mathematics question in the classroom. Results are presented in Figure 4.3.6 below.

Figure 4.3.6: Boys Jeer Girls when they Fail to Solve Mathematics Tasks

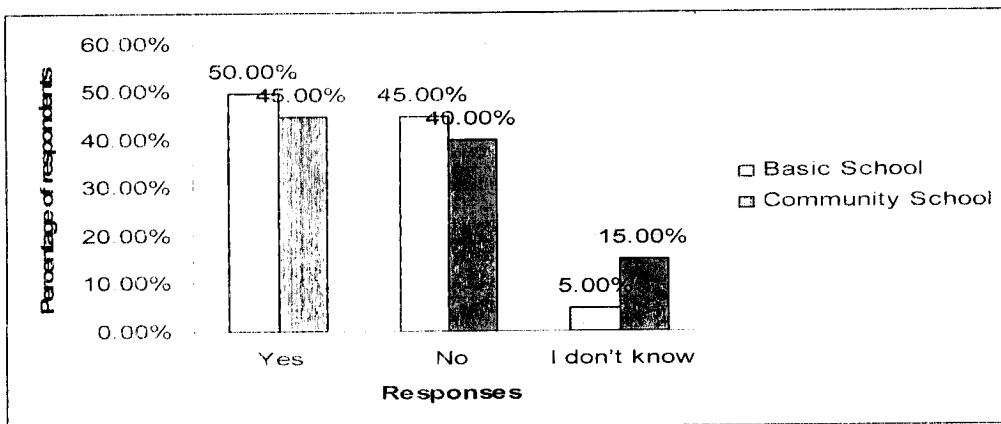


The above results show that out of 113 respondents from basic schools 34.0% agreed compared to 60.0% who disagreed while 6.0% did not know. From community schools, out of ninety-seven respondents, 10.0% agreed and 80.0% disagreed while 10.0% did not know.

4.3.7 Teachers do not Teach Well in Mathematics

Grade seven girls from basic and community schools' attitudes towards teachers' presentations of lessons in class was assessed regarding whether or not teachers do not teach well. Results are presented in Figure 4.3.7.

Figure 4.3.7: Teachers do not Teach Well in Mathematics



The above results show that out of 113 respondents from basic schools 50.0% agreed compared to 45.0% who disagreed while 5.0% did not know. From community schools, out of ninety-seven respondents, 45.0% agreed and 40.0% disagreed while 15.0% did not know.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.0 Introduction

This chapter discusses the findings of the study. The discussion of the study covers the performance of girls at grade seven level in basic schools as compared to community schools. The factors contributing to poor performance of girls including their attitudes in both school settings are discussed. The results of this study raise several implications as far as the performance of girls in mathematics is concerned.

5.1 Performance of Grade 7 Girls in Basic Schools as Compared to Community Schools

This study has revealed that girls from basic schools perform better in mathematics than those from community schools. The reasons forwarded for this are that most basic schools are stocked with textbooks and have trained teachers compared to community schools. Table 4.1 showed that basic school girls performed better than those in community schools where 70% of the girls from basic schools passed compared to 34% from community schools. The other reason for girls from basic schools' better performance than that of community schools could be that teachers apply right teaching methodologies and that they are trained. Community schools in many places in Chongwe district are manned by untrained teachers who have not received formal training in teaching methodologies. Additionally, basic schools are well organised in terms of structure than community schools.

These findings provide further evidence on the level of girls' performance to the skills attained. Girls from both basic and community schools achieved their highest score on computation problems mostly dealing

with addition and subtraction as evidenced in Table 4.1.2 and Table 4.1.3. The finding supports the argument by Foxman *et. al.*, (1980) who found out that girls performance was better in computation as compared to other areas that they tested such as number application. Going by this view, it can therefore, be said that girls do not experience difficulties in problems concerning computation as most of them do not involve a lot of steps. Further, addition and subtraction in mathematics are introduced at an early grade in both basic and community schools.

Armstrong (1980), had provided evidence that suggests that girls' poor performance in mathematics is as a result of discrepancy in recall, combination and application of relevant knowledge to a problem. Girls, regardless of them being at basic or community school fail to follow a problem through to its conclusion. The findings of this study seem to support this view. The results of this study, Tables 4.1.4, 4.1.5 and 4.1.6 show the results of the performance of girls in problems involving fractions, identifying relationships and general understanding of a problem. The results show that many girls did not perform well in these areas. These results reveal that girls experienced difficulty in fractions, items that required understanding and identifying relationships. These results seem to support Armstrong's findings.

In focus group discussions, teachers interviewed from both basic and community schools cited English language as a major problem that affected girls' performance in mathematics. Most of them were not able to read. They indicated that they had no choice but to use Chinyanja in many cases as they taught to ensure that pupils understood them.

It is reasonable to mention that most of the girls in rural areas in Chongwe district are unable to understand the English language. With such a challenge many of them were unable to find right answers and

opted to pick any answer from the given options. One would, therefore, assume that the teaching of mathematical concepts was not being adequately done as pupils at a certain stage are expected to read on their own. Equally, this may also be caused by poor teaching of English language by teachers which is supposed to support girls in solving mathematical items that involve problem solving. On views for poor performance of girls in mathematics, two grade seven female teachers interviewed had this to say....

‘Girls are lazy to concentrate.’

‘Most girls are lazy in mathematics as they do not want to think deeply.’

From the available literature on self-concept, (Wolf & Blix, 1981) pointed out that girls with a positive self-concept are more likely to have a positive attitude towards mathematics, which is likely to lead to good performance. It can, therefore, be said that if some girls are lazy and do not want to think deeply as teachers pointed out, they end up having negative self-concept and this affects their performance.

5.2 Main Factors affecting Girls Performance in Mathematics

5.2.1 Interaction in Classroom

Factors affecting girls’ performance in basic and community schools are presented in the previous chapter. The results (Figure 4.2.1) show that classroom interaction affects girls’ performance in mathematics in both settings. The results revealed that 69.2% and 57% of the girls from basic and community schools agreed that their performance was affected by the level of interaction in the classroom respectively. Those that considered interaction in the classroom as not one of the factors affecting girls performance for both basic and community schools were 25.6% and 40.8% respectively. A minority of respondents (5.2% basic and 2.1% community) had no idea on the issues.

5.2.2 Teacher Attitude

This study has revealed that teachers may contribute to girls' problems in mathematics by giving them less attention or a lower quality of attention during class. According to results (Figure 4.2.2) 78.6% of the girls from basic schools and 41.8% of girls from community schools agree that their performance was affected by teachers' attitude while 19.6% of girls from basic schools and 34.6% of the girls from community schools disagreed. This entails that teachers must be careful not to limit girls' potential in mathematics by using gender-biased practices. During mathematics instruction, teachers must be sure to call on girls for answers to questions, and to give them praise when appropriate.

Further, these results show that due to the fact that teachers in basic schools are trained, it can be assumed that they follow the methodology needed to teach mathematics. Further, due to constant in-service program's held in most of the basic schools, teachers share challenges they face in teaching mathematics and possible solutions are discussed. Contrarily to basic schools, community school teachers are not trained formally and those trained by Non-Governmental Organisations' in methodology do not stay long in these schools. Results from community schools seem to support the argument by the Ministry of Education (2007) that many community school teachers have not been able to apply basic teaching skills in their classrooms. Therefore, it can be assumed that teachers in community schools could not be expected to teach well if they lack formal training and this may be a contributing factor for the poor performance.

5.2.3 Cultural Factors

Cultural factors were assessed as to whether or not they contribute to the poor performance of girls in basic and community schools. Results presented in Figure 4.2.4 have shown that 47.9% of girls from basic

schools and 58% of girls from community schools agreed that cultural factors hinder girl's performance in mathematics. Those that disagreed with the statement were 47% from basic schools and 27% from community schools. A minority of 5.1% and 18.4% from basic and community schools respectively did not have any idea.

An explanation for this finding lies in the cultural belief which generally entails that a female is responsible for home chores. All the teachers interviewed agreed with the girls with highest responses from both basic and community schools. They said that some girls went to school tired and some of them even slept in class. This made them fail to concentrate in class. These results seem to support Seyoum (1986) findings that showed that girls' performance in mathematics could be related to their life style. They are responsible for house chores, to help their mothers who are over burdened. The variable on work at home and after school is important because the amount of work given to the girls after school would have a bearing on their level of concentration on homework. However, the findings indicate that giving home chores to girls before and after school lowers their learning achievement as they may be too tired to do homework.

5.3 Attitudes of Girls towards Mathematics

The attitude of girls from both basic and community schools towards mathematics was assessed under subheadings; girls prefer other subjects to mathematics, mathematics is for boys and not girls, boys jeer girls when they fail to answer a mathematical problem in class and teachers do not teach well in class.

5.3.1 Girls Prefer other Subjects to Mathematics

This study has revealed that girls prefer other subjects to mathematics. Figure 4.3.1 has shown that 37.6% of girls from basic schools and 50%

of girls from community schools agreed that girls prefer other objects to mathematics. This entails that girls from both basic and community schools have lower expectations in mathematics and that girls believe they do not have mathematical ability. When girls do poorly in mathematics, they attribute their poor performance to their inability to do mathematics.

Discussants in focus group discussions explained that girls' beliefs begin early in their education and persist into secondary school and probably beyond. Therefore, starting at the elementary school level, teachers need to encourage girls to have higher expectations for themselves in mathematics and offer other alternatives, positive explanations of their mathematics performance.

5.3.2 Mathematics is for Boys and not Girls

According to the findings of this study (Figure 4.3.2), 18.7% of girls from basic schools and 14.2% of girls from community schools agreed that mathematics is a subject for boys and not for girls. However, the majority of respondents from basic schools, 76% and 72% from community schools disagreed with the notion. This entails that girls in both basic and community schools were aware that mathematics is not just for boys but for girls too.

In focus group discussions, it was reported that grade seven girls in both basic and community schools do not recognise the subjects that they must study in order to have specific careers. It was further reported in the focus group discussions with teachers that grade seven girls have little career aspirations and their feelings about sex stereotypes in certain professional fields. They explained that students know that society accepts many different careers to be undertaken by women which are not mathematics related especially those who fail mathematics.

Neither the girls from basic schools nor those from community schools recognised the relation between the study of mathematics and their future career aspirations. Girls never realise that their preferred future careers will require course work in mathematics. It seems prudent for teachers to discuss with pupils the many professional fields that require mathematics.

5.3.3 Boys Jeer Girls when they Fail to Solve Mathematical Tasks

This study has revealed that the negative attitude of girls from both basic and community schools may be as a result of jeering perpetuated by boys when girls fail to provide answers to mathematical questions. According to Figure 4.3.3, 60% of girls from basic schools and 80% of girls from community schools disagreed with the statement. Those that agreed were 34% from basic schools and 10% from community schools.

According to focus group discussions with teachers, girls' negative attitudes and eventually poor performance in mathematics to some extent are as a result of jeering from boys. This may call for gendering-the separation of boys and girls. They explained that this may lead to girls developing positive attitude for mathematics. Further, focus group discussions revealed that separating boys and girls during mathematics may improve girls' negative attitudes towards mathematics. The results show that it is important for teachers to use suitable settings in the classrooms as they teach that will benefit the girls.

5.3.4 Teachers do not teach Well in Mathematics

The results presented in Figure 4.3.4 have shown that both groups of girls disagreed with the statement concerning teaching methods. The majority of respondents from both basic (50%) and community (45%) schools agreed that teachers do not teach well. They explained that teachers mostly point at boys and not girls when they want pupils'

participation in learning. These results are similar to those of Maimbolwa-Sinyangwe and Chilangwa (1995), that the larger amount of teacher initiated interaction in mathematics was directed towards boys. Girls were generally found to interact less with their teachers than the boys especially in the rural areas as boys were invited to answer questions even when they did not raise their hands.

In the focus group discussions with teachers, it was revealed that various reasons led to less interaction with girls. These included the idea that many girls were shy and not able to raise their hands. Sometimes when pointed at, they were not able to give answers. Some teachers indicated that they did not ignore the girls deliberately. These results seem to suggest that teachers point at both boys and girls as there are many class activities that involve both boys and girls.

Conclusion

The study has highlighted the barriers girls in basic and community schools face in their quest to improve their mathematics performance at grade seven. Factors that work against girls in grade seven from both basic and community schools include teachers, parents, and society's impact on girls' such as attitudes and perceptions, achievement and performance and career interests and aspirations. Parents' and teachers' expectations for girls in mathematics have an enormous impact on girls performance in mathematics. Girls internalise their teachers' and parents' negative expectations, which become self-fulfilling prophecies. Because girls believe that they cannot achieve in mathematics, they do not achieve in mathematics. Their poor performance reinforces parents and teachers' negative expectations and feeds the cycle of negative expectations and lack of achievement. Clearly, teachers' and parents' expectations for girls' performance in mathematics must be raised if girls are to have the opportunity to achieve in mathematics.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents conclusions and recommendations for the study directed at different stakeholders in basic and community schools.

6.1 Conclusion

The study was aimed at assessing the performance of girls in mathematics in basic and community schools. The study used both quantitative and qualitative methods of data collection and analysis and applied the labeling theory to the data collected. The study also reviewed the school documents such as registers, and report forms as a secondary source of data.

The study has shown that there are several factors that affect grade seven girls' performance in mathematics. These include interaction in class, teacher attitude and cultural issues.

Additionally, girls attitudes towards mathematics was assessed and results have shown that girls' own attitudes towards mathematics range from making mathematics as a boys and not a girls subject, preference for other subjects to mathematics and citing teachers for poor presentation of mathematics lessons.

This study has, therefore, established that there is no major variance in performance among girls from basic and community schools and that their performance in mathematics has a long history ranging from gender imbalance to the lack of career aspirations.

6.2 Recommendations

This section presents recommendations on the poor performance of grade seven girls in mathematics in both basic and community schools as follows:

6.2.1 Ministry of Education

- This study has revealed that community schools are manned by unqualified teachers who have difficulties in presenting mathematics lessons, it is therefore recommended that the Ministry of Education deploys qualified teachers to community schools or trains teachers in these schools.

6.2.2 Teachers

- Teachers have been noted in this study to contribute to girls' poor performance in mathematics in basic and community schools. It is therefore, recommended that teachers must be sure to call on girls for answers to questions, and to give them praise when appropriate. They should use methodologies which do not disadvantage girls.
- Girls' learning styles, attitudes, and behaviours in mathematics classes have shown a negative attitude. It is therefore, recommended that teachers emphasise the importance of mathematics in modern careers to girls.

6.2.3 Parents and Other Stakeholders

This study has revealed that cultural practices play a crucial role in girls' performance in mathematics. Due to household chores, girls have little time to do their revisions or let alone do their homework. It is therefore, recommended that communities be sensitised on the need for a girl child to find time to revise and do homework.

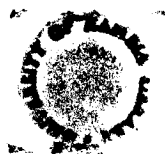
Further Research

Since this study focused on girls performance in mathematics from basic and community schools, it is therefore suggested that future research be conducted to look at the performance of girls in mathematics in relationship to that of boys in community schools in rural areas. This would be of help to bring out factors that may be affecting both boys and girls performance in mathematics.

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APPENDIX 1: QUESTIONNAIRE FOR GIRLS

UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

**DEPARTMENT OF SOCIOLOGY, PSYCHOLOGY AND SPECIAL
EDUCATION.**

Dear respondent,

- A. It is hoped that this questionnaire will help to highlight factors which effect girls' performance in Mathematics at grade seven level.
- B. Please feel free to respond to the questions and be assured that the information provided will be treated with a high degree of confidentiality. Therefore, there is no need to indicate your name.

SCHOOL.....

GRADE.....

INSTRUCTIONS.

Kindly please tick () your response to each given statement. Your response will be treated with high confidence.

1. Teachers are not sensitive to problems girls face in learning mathematics in our class.

YES	NO
-----	----

2. Teachers mostly point at boys to give answers during a mathematics lesson in my class even if girls raise their hands.

YES	NO
-----	----

3. Teachers give equal attention to both boys and girls during mathematics lesson.

YES	NO
-----	----

4. Girls spend most of their time doing home chores than homework in mathematics at home.

YES	NO
-----	----

5. Most girls like learning other subjects to learning mathematics in our class.

YES	NO
-----	----

6. I like mathematics very much.

YES	NO
-----	----

7. I do not perform well in mathematics because the teacher does not teach well.

YES	NO
-----	----

8. Boys perform better in mathematics than girls.

YES	NO
-----	----

9. Girls perform better in mathematics than boys.

YES	NO
-----	----

10. There is no difference between the performance of girls in basic and community schools.

YES	NO
-----	----

11. I am ill-treated by the boys when I fail to solve tasks in mathematics.

YES	NO
-----	----

12. Mathematics is a subject for boys and not for girl

YES	NO
-----	----

13. My parents/guardians support me in my mathematics learning at home.

YES	NO
-----	----

14. Mathematics is a difficult a subject for me therefore I do not work hard.

YES	NO
-----	----

15. I collect water, cook, sweep, clean plates and pots at home everyday before i go to school.

YES	NO
-----	----

16. Do you have any suggestions?

.....

.....

.....

.....

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.....

.....

APPENDIX 2: GRADE 7 MATHEMATICS TEST.

UNIVERSITY OF ZAMBIA

SCHOOL OF EDUCATION

**DEPARTMENT OF SOCIOLOGY, PSYCHOLOGY AND SPECIAL
EDUCATION.**

Dear respondent,

- A. It is hoped that this test will highlight the performance of girls in Mathematics.
 - B. Please feel free to write the test and be assured that the results will be treated with a high degree of confidentiality. Therefore, there is no need to indicate your name.
-

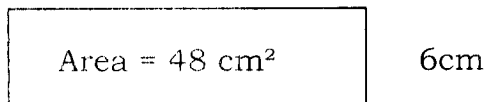
7. Add $3\frac{1}{2}$ and $4\frac{3}{4}$ =

- (a) $\frac{46}{6}$ (b) $\frac{4}{33}$ (c) $\frac{8}{4}$ (d) $\frac{33}{4}$

8. Which of the following is an open sentence?

- (a) $6 + \square = 11$ (b) $X - 8 = 21$ (c) $Y + 2 \geq 20$
(d) $M + 10 = 21$

9. Find the length of the side marked X in the figure below?



- (a) 8 cm (b) 6 cm (c) 42 cm (d) 54 cm

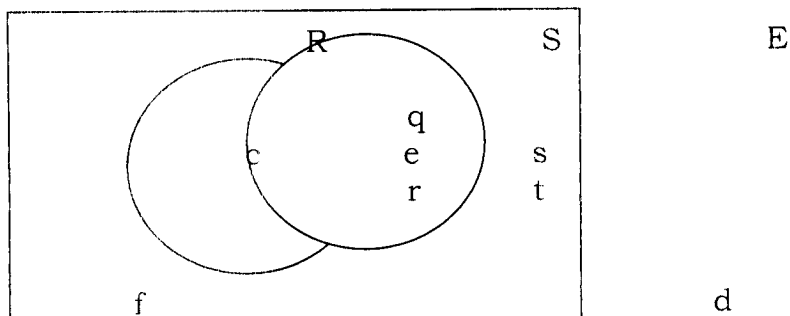
10. A car travels 280 km in 7 hours. Find the average speed of the Car?

- (a) 38km/h (b) 42km/h (c) 50km/h
(d) 40km/h

11. A boy cuts a long piece of wire into 5 pieces to make a wire car. The length of each piece is shown below:-
The total length of wire in cm = $34 + 33 + 31 + 27 + 25$. If he had to cut them in equal lengths, each piece would have been

- (a) 30cm (b) 150cm (c) 45cm (d) 24cm

12. The diagram below shows sets R and S



How many members are in the set R?

- (a) 5 (b) 4 (c) 3 (d) 2

13. $2575\text{g} = \text{----- Kg}$

- (a) 25.75kg (b) 275.5kg (c) 2575kg (d) 2.575kg

14. If each of the 7 boxes has 35 mangoes then the total number of mangoes is

- (a) 42 (b) 245 (c) 210 (d) 28

15. Mr. Mwale bought an umbrella for K12, 550-00. What was his change from K20, 000-00?

- (a) K7, 450.000 (b) K5, 300-00 (c) K6, 550-00 (d) K8, 250-00

16. The average of 4 numbers is 24. Three of the numbers are 10, 27 and 36. What is the fourth number?

- (a) 34 (b) 36 (c) 23 (d) 46

17. What is $\frac{1}{3}$ of 36?

- (a) 9 (b) 12 (c) 33 (d) 39

18. $12 \times 7 = \square \times 14$, then \square is

- (a) 4 (b) 6 (c) 5 (d) 7

19. A bus starts off from Chipata at 06:45 hours and takes 12 hours 35 minutes to reach Livingstone. At what time will it reach Livingstone?

- (a) 20:30 hours (b) 19:45 hours (c) 18:20 hours

(d) 19:20 hours.

20. If $\frac{3x}{7} = 6$, then x is

- (a) 42 (b) 21 (c) 14 (d) 7

APPENDIX 3: INTERVIEW GUIDE FOR TEACHERS.
UNIVERSITY OF ZAMBIA
SCHOOL OF EDUCATION
DEPARTMENT OF SOCIOLOGY, PSYCHOLOGY AND SPECIAL
EDUCATION.

AN INTERVIEW GUIDE FOR TEACHERS.

I am a student at the University of Zambia currently studying for a Masters Degree in Sociology of Education. I am researching on the academic performance of girls in Mathematics at grade seven level. Whatever information that I shall collect will be treated with the highest level of confidentiality.

1. How many years have you been teaching at grade seven level?
2. What are the key problems are associated with Mathematics that affect girls performance in the school?
3. What factors at school level affects girls in learning of Mathematics?
4. What factors at home contribute towards the performance of girls in Mathematics?
5. What do you think are the best ways of dealing with the problems of poor performance of girls in Mathematics?
6. Do parents / Guardians give assistants to girls in Mathematics at home?
7. Are do cultural believes affects girls performance in Mathematics?
8. Are there any specific areas in Mathematics are difficult for girls?
9. Are there attitudes that affect girls' performance in Mathematics at grade seven level?
10. How do you think girls should be helped to enhance performance in Mathematics?



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P.O. BOX 22, CHONGWE

16 / 07 / 08

Permission is granted to the student to proceed with his assignment
MAM
KIDEBI

Dear Sir/Madam,

TO WHOM IT MAY CONCERN

The bearer JOSEPH M'SONI holding a computer number 526003716 is a bonafide student of this Institution. He/She is currently pursuing MASTERS DEGREE programme and would like to utilize your Institutional facility for the purpose relating to his/her studies.

However, further explanation pertaining to the student's request would be met by the bearer him/herself.

Your assistance and co-operation would be very much treasured.

Yours faithfully,

ph

O. C Chakulimba, PhD
HEAD - DEPARTMENT OF EDUCATIONAL PSYCHOLOGY, SOCIOLOGY AND SPECIAL EDUCATION

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