

CHAPTER ONE

INTRODUCTION

Background to the study

Mathematics is the science which deals with the study of numbers, quantities and shapes. Mathematics plays a very important role in the total educational process. It is in view of this that mathematics has been made core subject right from the onset when education was introduced. Mathematics is logical. It trains the mind to work logical and also it is a practical tool (Banini, 1998). Development in almost all areas of life is base on effective knowledge of mathematics, mathematics and English language. There simply cannot be any meaningful development in any virtual area of life without the knowledge of mathematics. It is for this reason that the educational system of countries that are serious about their development put great deal of emphasis on the study of mathematics.

Mathematics at the primary school level in Ghana, emphasis knowledge and skills that will help the pupils to develop the foundation for numeracy. Mathematics has become more or less a burden on majority of student than a problem-solving subject. The need for the ‘girl-child’ to attend school came as a relevant topic for discussion along the length and breadth of the (Dolphyne, 1991).

Gender as an issue related to mathematics teaching and learning needs to be looked into in this modern era of scientific and technological advancement. The interest group is the basic school which is the pivot on which major educational activities are centered. For some time

now, the focus has been on girls, especially in the mathematics oriented fields. In totality, the number of males who offer mathematics and its related courses at the Senior High School seems to outweigh their female contemporaries. This may be as a result of several factors. The attitude of girls towards mathematics at the basic school level needs much to be looked into.

The basic school level is the critical stage where most educational decisions are taken. For pupils to offer mathematics at the higher level of education, the decision is made at the primary School level before writing the Basic Education Certificate Examination. There is the need therefore to sensitive girls at the Basic School level to be more interested in mathematics, since it has been realized that only few girls at this level choose mathematics as a programme for the Senior High School (SHS). There is therefore a displayed trend. The higher one goes the lower proportion of females offering mathematics in spite of the fact that females constitute the highest percentage of the population. (Sjoberg and Imsen 1999)

Statement of the problem

It is not uncommon to observe a downward change in attitude and mood of girls when it comes to Mathematics lessons. Unlike boys, girls rarely respond to questions in Mathematics class or even ask questions. Moreover, most of these girls were noted of giving inaccurate answers to questions. This is due to the fact that, they lack self confidence and look shy to participate. Girls also spend a relatively longer time on class exercises and tests. This is unfortunate as far as equity in education is concerned. However, since the aim of schooling is to help bring out the good in every child, this problem cannot be left unattended to. The study

is intended to employ strategies to enhance basic six (6) girls of Sankubenase Presby Primary School to participate actively in Mathematics lessons.

Purpose of the study

This study attempts to;

1. explore the causes of the poor performance of primary 6 girls of Sankubenase Presby Primary School in Mathematics
2. improve their (girls) performance through active participation in the learning of Mathematics through the use of appropriate methods of teaching mathematics.
3. find out effects of these methods on the learning of mathematics by girls.

Research questions

In pursuance of the above statements made, the following questions are framed to guide the study:

- i. What are the causes of the poor performance of primary six girls of primary 6 girls of Sankubenase Presby Primary School?
- ii. What methods can be used in teaching mathematics to improve girls performance through active participation in the learning of mathematics?
- iii. What are the effects of the method in the teaching and learning of mathematics?

Significance of the study

The study seeks to serve as a source of information to influence the types of activities to be included in the Mathematics curriculum and textbooks to enhance and sustain girls' interest to pursue Mathematics. It will also help to bridge the gap between boys and girls (gender gap)

participation in Mathematics lessons. This equal participation (gender balance) would help girls to improve upon their performance in Mathematics assessment.

Another significance is that, the outcomes of this study would create an awareness to all stakeholders about the capabilities of girls in the pursuit of Mathematics. This would help minimize prejudice or stereotyping against girls in Mathematics education. At the school level, the study would help Mathematics teachers to adopt appropriate methods and teaching and learning materials that are girls friendly during Mathematics lessons.

Delimitations of the study

The study could have been extended to cover all primary girls in all the basic schools in Ghana. Also views could have been sought from all sources of necessity and all the types of activity methods used. But considering the period within which to write the project, the study was limited to the primary six (6) girls of Sankubenase Presby Primary School.

Organization of the study

Chapter one deals with the introduction, background to the study, statement of the problem, purpose of the study, the research questions, significance of the study, limitations and delimitations of the study and organization of the study. Chapter two reviews literature on related topics. In it various principles and suggestions put forward by some authorities on the problem regarding its concept, causes and how to improve it are discussed.

Chapter three discusses the research methodology, sample size (population), instruments, data collection methods and the interventions introduced to rectify the problem. Chapter four also

deals with data presentation, analysis and discussion of the pertinent issues identified in the data.

Chapter five which is the last chapter of the study also underlines the summary of findings, conclusions, recommendations, references and the appendices of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter will hence review related literature on the topic “helping primary 6 girls of Sankubenase Presby primary to participate actively in Mathematics lessons” under the following sub – topics:

- Factors affecting the performance of girls Mathematics Education
- The concept girl – child education
- Gender issues in mathematics
- Factors affecting the effective teaching of Mathematics in schools
- Participatory methods of teaching
- Strategies of increasing girls’ participation in mathematics class

Factors affecting the performance of girls Mathematics Education

According to Cambell et al (2002), Wenglinsky (2002), and Davis and Rosser (1996), the classroom environment has been identified as an important factor hindering the participation of girls in Mathematics lessons. This is because all other factors come to play in the classroom since it is a microcosm of the larger society. The social classroom environment is

one which provides for involvement, interaction and socialization. Research points to several practices that promote an equitable learning environment for girls and have a positive impact on their continuation in qualitative discipline and Mathematics. They include collaborative learning, hands on experiences, and emphasis on practical applications and the teaching of Mathematics in a more holistic and social context.

Tingiri (1997), conducted a research on girls and Mathematics education in the Bawku East District and came out with the findings that, some Mathematics teachers lacked the appropriate skills and strategies for teaching the subject, so they kept giving notes to the pupils which they also copied without understanding them. This method of teaching according to him has caused many girls to lose interest in Mathematics. Tingiri recommends that, basic Mathematics teaching should be made compulsory in all Teacher Colleges of Education so that teachers can be equipped with the necessary skills need to teach Mathematics when they go to the field. Mathematics teaching should be organized to reflect the process approach which represents critical thinking and problem solving.

The Concept of Girl – Child Education

In almost all African societies, the man is the head of the family, he is considered as a person capable, responsible and intelligent in all spheres of life in the communities. When there is danger, men are called upon. Very crucial and vital societal decisions are taken by men and their women counterparts have to comply, Okeke (1986).

Amedeker (1999) indicates that in countries of Africa, societal factors assign particular but unsimilar tasks to girls and boys. For instance, young girls build for themselves image that they are not prone to very strenuous jobs (tasks). On the other hand, their male counterparts

are strong and tend to do tedious jobs that make them aggressive. This means that, our cultural practices as Africans are bias. It shows how normal it is when most Ghanaian girls express low participatory level in Mathematics and its related courses.

The low number of females in Mathematics and its related courses in the senior high and tertiary levels of education is attributed to the poor attitude of girls toward Mathematics at the lower levels of our educational system. This poor attitude of girls toward Mathematics is blamed on a number of factors. Wisconsin and Stiegar (1993) are of the view that practical and pedagogical barrier to girls performing well in Mathematics raises concerns which included lack of female role models, teachers paying more attention to boys than girls and pursuit in textbooks.

Others blame it on socio-cultural barriers as being among the greatest impediment to women's access to scientific and technological education, this is often due to unconscious influence in the home, from parental and family opinion, cultural and social norms among others. Some societies also assume that child caring and care for the sick and elderly are primarily women's job, (Spencer, 1985).

In order to make female children feminine and womanly, parents should encourage a tendency towards concrete and relational thought and a preference for personal caring service to other people. These traits prepare girls and women to prefer teaching, mothering and other services and caring activities in contrast to those that are essential for careers in Mathematics, Mathematics and Engineering. The ability of girls and women is questionable; females are discouraged from taking scientific and technical courses because it is generally thought that

they are difficult and therefore, they are for men only. The general societal image of scientific careers is incompatible with a mother's role. This therefore, jeopardizes women's chances of getting married. These negative societal attitudes create lack of self – confidence among females in their ability and motivation to opt for Mathematics, (UNESCO, 1999).

Dolphyne (1991) asserts that, women education have always lagged behind men's in all African societies because it is traditionally considered that the major role of women is to ensure the community of the lineage and she is expected to marry soon after puberty. Tettey (2002) also says that, women were only acceptable as home makers and relegated to household chores such as cooking, cleaning the home, bearing children and helping their husbands on the farm, for a fee or get paid in kind in the form of food supplies. Adu (1999) says that girl-child education was hitherto considered by the society as a waste of family resources as a woman's role was to be in the kitchen and in the bedroom. At last, Kwegyir Aggrey's (1924) role in co-education later shattered this negative perception in that certain women broke through these cultural and traditional barriers and occupied other valuable and key positions in public and civil services.

Gender issues in mathematics

Bartsch et al (1998) agreed that in many countries including Ghana, recruitment of females to areas of mathematical studies is falling, or at least not developing as fast as expected. This lack of interest in mathematics often manifests itself at school level at the age where curricular choices are made. In many countries, including Ghana, there is also a growing gender gap in the choice of scientific and technological subjects at both school and tertiary

level. Many countries have had a long period of study growth in female participation in traditionally male fields of study, but the positive trend seems now to have been broken in some countries. The same countries have very low female participation rates in mathematics related occupations and studies.

Factors affecting the effective teaching of Mathematics in schools

Bajah (1983) identified the following limitations in his research journal.

- Lack and inadequate facilities and equipment: Most public and private basic schools lack facilities and equipment that promote effective teaching and learning mathematics in Africa. A few schools especially the private ones have mathematics laboratories, which are well equipped. Due to lack of those facilities, most teachers teach mathematics in the instrumental way, which encourage rote learning to reduce interest in learning mathematics. Learner-centred learning can only be encouraged where there is enough teaching learning materials suitable for teaching mathematics, for the mathematics class to be full of activity to remove boredom and promote interest and understanding. Adeyanju (1997) stated that learning can be reinforced with learning aids of different varieties because they stimulate, motivate, as well as arrest-learners attention for a while during the instructional process.
- Lack and inadequate qualified teachers: Mathematics and Technology are often poorly treated in the preparation of teachers for children of primary school age. Moreover, those girls who choose to become primary school teachers are often those who did not study, or did not like mathematics themselves in school. The present decline in recruitment of mathematics teachers in many countries in African is particularly evident in secondary

schools. In fact, it can be attributed to a general decline in teachers' status and relative salary found in a number of countries. The rather low number of girls with scientific backgrounds is able to find more tempting and better paid jobs than teaching. In addition, the teaching profession is becoming increasingly female especially at the primary level (UNESCO, 2000).

The Ghanaian society, according to Anamuah-Mensah (1995) is impregnated with values, norms and beliefs. Some of these beliefs are inimical to girls' participation in Mathematics which among others include;

- Mathematics is more important for boys than girls.
- Mathematics is difficult for girls.
- Girls who excel in Mathematics are witches.
- The place for the woman is the kitchen.

These beliefs have permeated the Ghanaian society that most girls naturally shun away from Mathematics. Banini, (1998) in his investigation into girls dislike for Mathematics revealed that the society is responsible for both the masculine image of Mathematics and gender identification of boys and girls while the schools are responsible for producing and reinforcing both stereotype. At the end of this study, he suggested among others that;

- the childhood training given to children at home must be considered seriously.
- there should be a discouragement of assigning roles to the sexes with girls at the disadvantage position.

- at the early developmental stage girls should be made to understand that a woman's ideal place is not only in the kitchen but also within the society at large.

Participatory methods of teaching

Effective teaching and learning takes place when the learner is able to apply positively the knowledge gained and the skills acquired to practical life situations. This in effect means that, more participatory or experimental teaching methods should be used instead of traditional didactic methods (Ministry of Education, Youth and Sports, 2005). Participatory methods of teaching are activity centered and they assist the learner to develop critical thinking, assertiveness and decision making skills. They also develop desirable attitudes and behavior (Ghana Education Services, CRDD, 2001). They include;

1. Values clarification
2. Futures' wheel
3. Brainstorming
4. Case study
5. Role – play
6. Dramatisation
7. Discussion (Small group, Class or panel discussion)
8. Games
9. Field Trip
10. Story Telling
11. Question and Answer/ Quiz
12. Exhibitions

Strategies of increasing girls' participation in mathematics lessons

Twumasi, (2007), identified that, the Mathematics curricula are key factors in developing participation in mathematics. This include employing child-centred activities, involving girls in leadership roles during group work, putting up the needed facilities and providing the necessary equipment for mathematics teaching.

Ferreira, (2001) asserted that to enhance active involvement of girls in disliked subjects, teachers need to use appropriate and adequate teaching learning materials. The material should be appropriate for the topic and the methods used and also correspond to the level of the pupils. Pictures and other relevant items should be used to let the pupils have a real life and practical situation. He continued that, teaching learning materials increases and sustains interest when used judiciously. It gives pupils a clearer idea about the lesson. Moreover, the stated that, there should be room for questions to be asked by pupils. Pupils should be called to give some illustrations on the chalkboard where necessary. This removes boredom and makes the lesson more interesting. Mathematical tools and equipments should be in a good shape. Pupils should also be encouraged to acquire their own equipments to be able to do their own practice.

Eminah (1993) asserted that, girls are likely to equal to boys or even better when they are encouraged by their teachers during Mathematics lessons. Scott (1986), discovered in a case study on girls and Mathematics education that the vast majority of the Mathematics principles were developed by men and taught with “male audience in mind”. He further stated that most Mathematics questions which teachers asked were based on male occupation which many

girls were not conversant with. Female Mathematics teachers and other activists could be role models as what the girls need is encouragement to build up their self confidence.

Moreover, Epstein (1974), explained that the quality of teacher-pupil relationship dramatically affects pupils personal need in the classroom. Teachers must understand the influence they have on girls and use this influence positively. A significant body of research indicates that academic achievement and girls' behaviour are influenced by the quality of the teacher-student relationship. Girls prefer teachers who are warm and friendly and to talk to each other about their ideas.

American Association for the Advancement of Mathematics (AAAS, 1989), and National Mathematics Standards (NSS, 1996), addressed the unequal ratio of females who seek careers in Mathematics, Mathematics and Engineering. These educational reforms state that Mathematics ought to be taught in a way that promotes Mathematics literacy for all. The reforms also suggest that Mathematics be taught in a way that is not biased against the experiences of girls or other sub groups and recommends that learning outcomes be inclusive to the experiences of the increasing diverse population of learners in Mathematics classrooms.

Furthermore, Koch (2002), explained that a number of teaching approaches to address girls participation during Mathematics instructions have been suggested. These are open discussions, questions and answers method, and feminist pedagogy. Open discussion is a necessary condition for successful teaching and learning in Mathematics. This facilitates the participation of female girls in Mathematics classes. Multiple Mathematics instruction strategies such as laboratory activities, demonstration and discussions enable female girls to

enter into caring relationship which facilitates their understanding of Mathematics. Multiple forms of instruction may motivate learners to become more active in the classroom to learn Mathematics.

Also, Bartsch, et al (1998) agreed with Ferreira (2001), that certain teaching strategies foster girls' participation and achievement in Mathematics. For instance, some studies have found that co-operative learning groups and active learning motivate girls to study Mathematics. Question and answer activities in the form of "circle-talk" facilitate classroom dialogue in an environment where female learners voice out their thought. This meaningful classroom conversation premised on connectedness and caring. Feminist pedagogy in Mathematics classes can be understood as a conceptual framework responsive to the experiences of girls who may suffer other forms of inequality. Such classes are characterized by collaboration, effective and personal engagement, Her Majesty's O. (1980).

Summary of literature review

With reference to the review of related literature on the topic, "strategies to enhance primary 6 girls of Sankubenase Presby Primary School to participate actively in Mathematics lessons. It was however realized that girls enroll in Mathematics courses in single-sex schools than in mixed schools which is an indication that girls can take up more difficult task in societies where such unhelpful beliefs, customs and practices are not reinforced as the case in most single-sex girls' schools. The research work reviewed some attempt to find solution to the

dislike girls have for Mathematics. However, the question of low participation of girls in Mathematics will still be the same if teachers, parents, school authorities and other stakeholders in education do not take appropriate steps to make Mathematics girl-friendly.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter dealt with the research design, the population and sample selection as well as research instruments used in the collection of data for the study.

Description of research area

The study was carried out in Sankubenase Presby Primary school in the Atiwa District in the Eastern Region of Ghana. Sankubenase is a community near Anyinam. It is a twenty minutes drive from Anyinam Township. The school has a population of two hundred and seventy – six (276) comprising one hundred and thirty – six (136) boys and one hundred and forty (140) girls. A class has an average of forty – six (46) pupils. Geographically, the school is in the Eastern part of the Sankubenase Township.

Research design

The research design use is the action research design. According to Cohem et al (2000), action research is a kind of research activity in which the researcher works collaboratively with other peoples to solve perceived problems. It is an approach which aims at improving a problem related situation through change. They further identified the following as strengths of the action research;

- Employing intervention strategies to find solutions to an identified problems.
- Helping teachers to realize what actually goes on in the teaching learning situation.
- Improving the researcher's professional status and personal practices.
- Improving upon educational practices in a particular school environment.

One demerit of action research is that it limits the researcher to a particular environment.

Population

The population for the study includes pupils of Sankubenase Presby Primary school in the Atiwa District. The school has a population of two hundred and seventy – six (276) comprising one hundred and thirty – six (136) boys and one hundred and forty (140) girls. A class has an average of forty – six (46) pupils.

Sample and sampling procedure

Due to limited time in carrying out the research work, the researcher through purposive sampling technique selected basic six (6) class as the accessible population. In purposive sampling also known as judgmental sampling, subjects who fall within the topic under study are selected (Cohem et al (2000)). Pupils' population of basic six class is forty – one (41). This comprises of twenty – one girls (21) and twenty (20) boys. However, through weeks of careful observation of pupils' attitude towards mathematics lesson, the researcher selected all the girls for the study because he wants all the pupils to benefit from the remedial action to be taken.

Research instruments

The major instrument used for data collection was observation and tests. Considering the topic under study, its purpose as well as the population, it was deemed necessary to use these tools in the collection (gathering) of data needed for the study.

Observation

Observation means to watch carefully the way something happens or someone does something especially to learn from it. Basic 6 girls were observed by the researcher on different occasions during mathematics lessons. All observations made were recorded for the purpose of the study. Observation offers first hand information on about a topic and withholds the disadvantages that go with relying on the report for other people. However, because it is less complicated, it is time consuming.

Test

This was another tool employed by the researcher in the course of his findings. This tool was employed before the intervention and it has two components namely the diagnostic test or a pre-test and the pos-test form the data collected.

Intervention processes

Intervention is a set of strategies planned and implemented to solve a specific problem or improve an educational practice. It involves a step-by-step procedure which is constantly monitored over varying periods of time and by a variety of mechanisms. Intervention activities are planned, implemented and monitored for a period of time. Intervention processes may consist of the pre- intervention, intervention and post-intervention processes.

Pre - intervention

The researcher administered a pre-test (pre-intervention) to know the actual academic performance of the pupils on the problem studied at the onset of the intervention process (procedure). The researcher also collected the pre-test data as a baseline and marked the

scripts. There were fifteen test items of which was scored over fifteen (15). Data collected from the pre – test was enough to justify pupils’ poor performance in the topic.

Intervention

The subsequent weeks were used for the intervention strategies (techniques) which included; small group problem solving and child – centred demonstration. The intervention was planned for three weeks.

Week one

Small group problem solving

This was an approach use to involve the active participation of girls in Mathematics in various mixed ability groups as the centre of the teaching and learning process. The various ability groups of the class were determined from the previous terminal examination results, responses to class questionnaires during lessons, exercises, home works (assignments) and class tests given them.

The pupils were then put into mixed ability groups of five (5) to investigate a task on the topic ‘number plane’ with enough teaching aids available to them. The girls were allowed to learn through first-hand experience by interacting with the materials provided for them to create curiosity, critical thinking, creativity and problem-solving skills. The girls were also guided to discover facts, concepts and make predictions for themselves instead of being told by the researcher who was acting as a facilitator. Pupils also brainstormed to explain their findings during class activity. Both group and individual contributions of pupils were assessed.

Child – centered demonstration

Week two

This approach was used to involve all pupils in the class to participate in the activities marked in the lesson. The approach through demonstration, centred on the learners in the classroom with the researcher as a facilitator. Each child was given a material. The girls were helped to develop and exhibit their manipulative skill. The researcher also demonstrated the proper ways of locating and plot points on the graph sheet gradually and pupils were made to practice as they observe. They do this at their own pace.

Week three

The researcher repeated the process to assist pupils finding difficulty in plotting points in the number plane. This intervention was carried out for three weeks. The post-test was conducted to assess the improvement of pupils.

Post – intervention

After the intervention, a post - test was conducted by the researcher to find out the extent to which the intervention has helped solve the problem. The post – test contained fifteen test items just as the pre – test comprising fifteen (15) questions. Pupils were given twenty (20) minutes to complete the test and it was scored over 15 just as the pre – test. Data recorded is presented in chapter four.

Limitations of the study

This research work was limited by a lot of factors which include truancy on the part of some pupils sampled for the study. Some pupils were absent from school during certain days

marked for the intervention. This hampered the progress of the study. Insufficient time allocated for the projects work was another setback. The research had to use limited time to carry out all the activities for the research work. Moreover, insufficient logistics and other teaching and learning materials affected the study. Pupils had to be put in groups to get access to some materials instead on handling it alone.

Analysis of data

Data collected was analyzed using tables expressing the frequencies and percentages of data, descriptive analysis and graphs

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

Introduction

This chapter presents the analysis of the quantitative data obtained during the study with reflection to the distribution of marks (scores) obtained by pupils during the pre – test and post – test stages. These analyses will help the researcher to draw some conclusions. People and things may be described in quantitative terms.

Analysis of data

The descriptive analysis of the data collected during the pre – test as shown in table 1.

Table 1

Pre - test scores

Marks	Number of girls	Percentage (%)
1 – 3	5	25
4 – 6	9	45
7 – 9	6	30
10 – 12	0	0
13 – 15	0	0
Total	20	100

Table 1 revealed that, 5 girls representing 25% had marks between 1- 3 and 9 girls also representing 45% had marks between 4 – 6. However, 6 girls representing 30% scored marks between 7 – 9. It is very clear that, pupils score marks between 1 – 9. The data presented shows a poor performance in the pre – test.

Figure 1

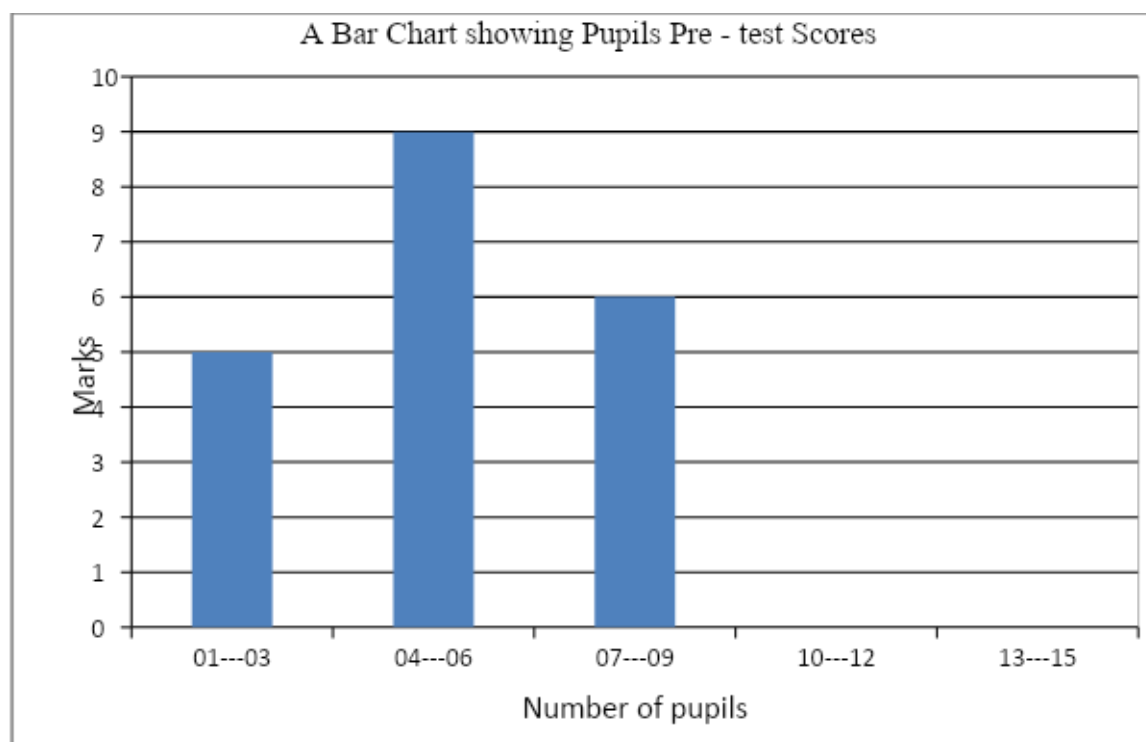


Table 2

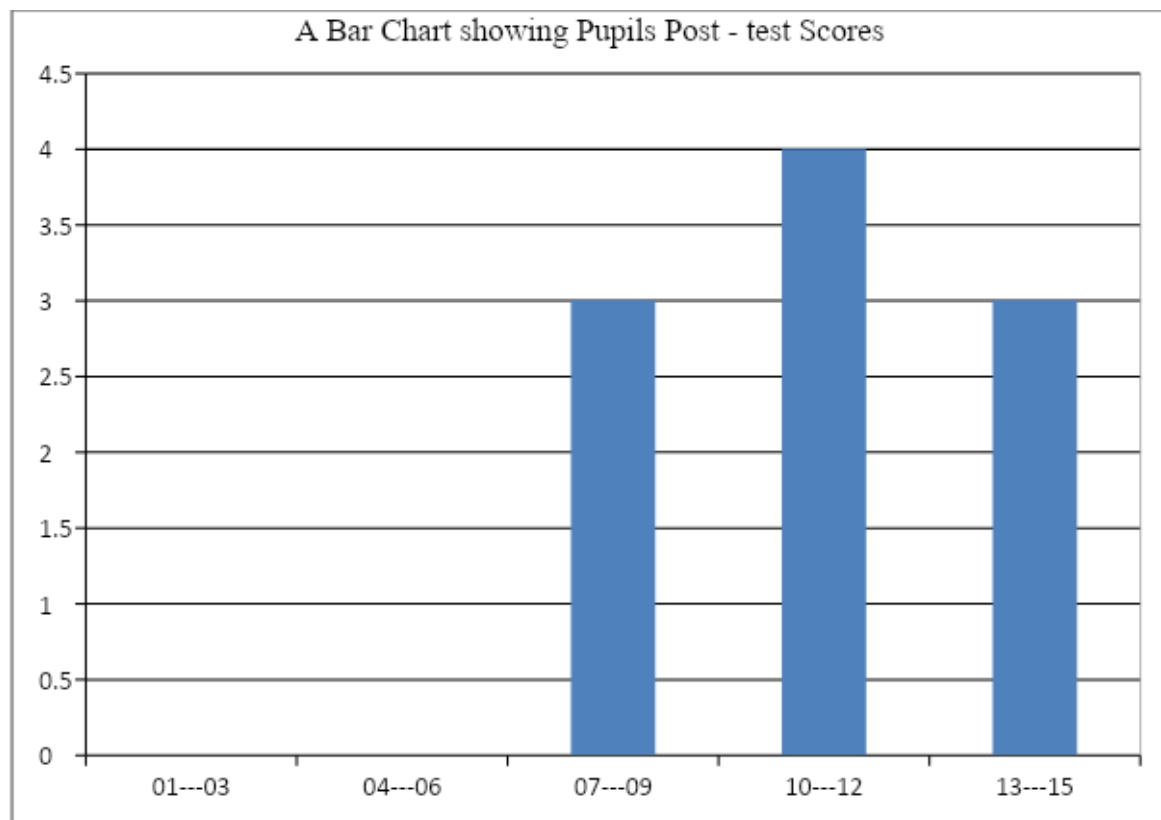
Total score girls obtained in post– test

Marks	Number of girls	Percentage (%)
1 – 3	0	0
4 – 6	0	0

7 – 9	3	15
10 – 12	12	60
13 – 15	5	25
Total	20	100

Table 2 shows data on pupil post – test results. It reveals that, 3 girls of 15% had marks between 7 - 9. Also 12 girls obtained marks between 10 -12. Another 5 girls had marks between 13-15. The data shows an improvement in pupils’ performance as compared to the pre – test stage. It can be however be said that, the intervention employed truly made an impact in pupils academic work.

Figure 2



CHAPTER FIVE

DISCUSSION OF RESULTS, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter discusses the results. It also serves to draw conclusion in light of findings and finally makes recommendation to remedy the problem of devising strategies to enhance girls' participation in mathematics.

Discussion of results

The main purpose of this research was to identify strategies to improve the low participation of primary 6 girls in Mathematics lessons and effect change in behavior of the learners to enable them become functional members in the society they live and to enhance their academic performance at Sankubenase Presby Primary School.

Teaching and learning occurs when there is an interaction between the teacher, who is also the first and foremost Teaching and Learning Resources, the learner and materials. The researcher observed that the female students of Sankubenase Presby Primary School performed poorly in mathematics. They did not participate actively in mathematics lessons.

The researcher decided to identify the causes of poor performance of female students in mathematics and to institute the necessary measures to address the problem.

Conclusion

Initial observation made was the poor participation of girls in Mathematics lessons. Pre – test conducted by the research also prove the identified problem. However, the interventions explored were very successful. It has lead to an active participation of basic six (6) girls in the subject. From the study it is therefore concluded that, the girl-child is also capable of attaining high academic goals like their boy counterparts. The study has also revealed that some methods as well as the attitudes of some teachers are highly responsible for girls' lack of interest and innovation to learn Mathematics.

Recommendations

With reference to, the findings made in this research the following recommendations have been made to pupils, teachers, parents, the government, non-governmental organization and all stakeholders of education. It is recommended that:

1. Mathematics teachers should employ group problem solving in mathematics class to encourage peer teaching.
2. Individual pupils should be involved during mathematics lessons instruction. Thus, mathematics teachers should direct his or her teaching to each pupil in the class.
3. Teachers and educational stakeholders need to effectively combine their knowledge of subject matter and methodology to stimulate the interest of girls.
4. Parents and other members of society should change their attitude and rather encourage girls to take active participation in subjects like Mathematics.

5. The Government in collaboration with Ghana Education Service (GES) should provide the schools with adequate teaching learning materials.
6. In-service training should be organized periodically by the Ghana Education Service (GES) for mathematics teachers to help upgrade them and for them to be abreast with new methods of delivering the subject.
7. Government should provide special packages, incentives or scholarships to girls who offer mathematics in the secondary schools to help entice girls into offering mathematics at all levels of education.
8. Teachers should prepare in advance and be well vested in the subject matter of topics they intend to teach in mathematics class.
9. Mathematics curriculum planners and textbooks writers should be very considerate in selecting activities to develop various concepts in mathematics. Classroom teachers should be consulted to capture the most appropriate activities in mathematics textbooks.

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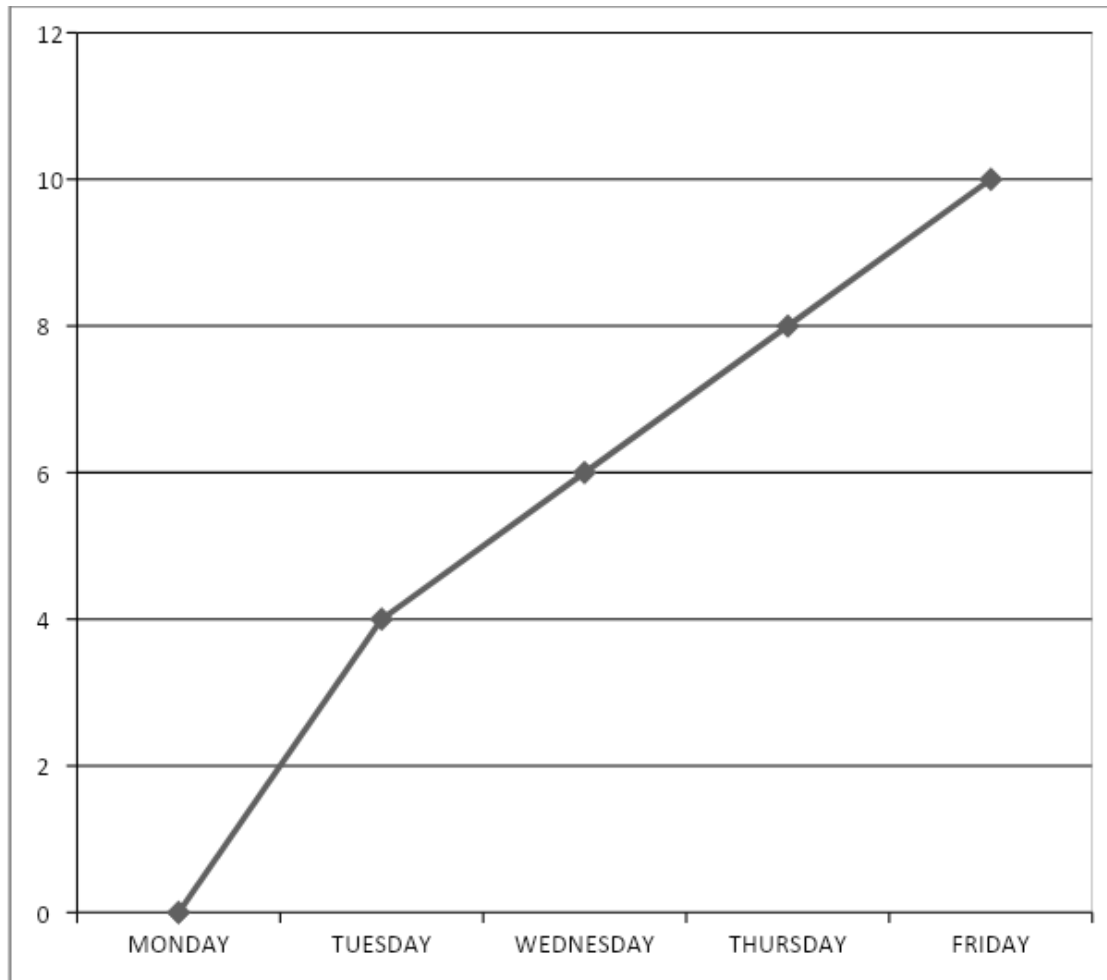
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APPENDICES

Appendix A

A Line Graph pupils used for the interventional processes in their graph book

Line graph 1



Line graph 2

