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Study of Secondary Schools Students Performance in Mathematics from Zimbabwe

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ABSTRACT The study was set up to determine some causes of poor performance in Mathematics examinations at Ordinary ('O') levels in Gweru District Day Secondary Schools in Zimbabwe. For the purpose of establishing the causes, ten day secondary schools in the district were investigated. The research design employed was the descriptive survey because of its ability to address current issues during the time of the study. Ten 'O' level mathematics teachers and their heads of departments were sampled. This information was collected through the use of teacher questionnaire and Head of Departments (H.O.D) questionnaires which enabled the researchers to have a wider view on the research problem. The questionnaires were physically administered by the researchers from school to school which facilitated a 100% return rate. Data collected was grouped and presented in tables in the form of numbers and interpretation. The results obtained from the study indicated that teaching methods and negative attitudes by students of both sexes are some of the causes of poor performance by students at 'O' level mathematics. The study recommends regular staff development workshops.

INTRODUCTION

Mathematics is a very important subject which facilitates the study of other subjects of the school curriculum. It is a tool with which man interprets, understands and makes use of his environment. Mathematics educators and scholars have continued to remind us of its importance. They have stressed the need to teach mathematics well so that it is well understood and applied. Unfortunately, the poor performance of most students at 'O' level examinations in this subject has been at variance with this proposition and this has prompted the researchers to embark on this study. The problem of poor performance in mathematics is one of the chief concerns of teachers and other mathematics educators worldwide. It is believed that poor performance can yield negative attitudes and even fear of mathematics by pupils. This assertion is supported by Lance (2002: 23) who says poor performance can cause 'matho-phobia' which he defines as ''… an irrational dread or anxiety that blocks people from learning and enjoying anything they recognize as mathematical."

Of great worry to the researchers as former 'O' level examiners is the fact that many centers, especially day secondary schools, have proved through marked scripts that very few candidates or none at all in some cases manage to pass mathematics. In support of this observation, several other teachers in the local mathematics cluster and district circuit have aired the same sentiments pertaining to poor performance at mathematics by pupils. One of the researchers, has been a mathematics teacher at a rural day secondary school in Gweru district since 1994, and has been disturbed by the successive poor results in 'O' Level mathematics at his school. This prompted the researchers to find out the pass rate in 'O' Level mathematics examinations of other day secondary schools in Gweru district as from 1994. Table 1 shows the performance of 'O' Level students in mathematics for the years 1994, 1995 and 1996 for all day secondary schools in Gweru district.

Table 1: Summary of pass rates in 'O' level mathematics for Gweru Day secondary schools (1994-1996)

Name of school	*Percentage pass rate*		
	1994	1995	1996
Ascot	17.3	18.0	23.0
Chiwundura	8.3	15.4	22.2
Dorset	20.0	10.0	5.0
Gambiza	10.7	2.1	8.0
Gunde	24.0	10.0	30.2
Hwata	-	-	0
Maboleni	23.8	5.9	6.1
Makulambila	18.8	21.4	9.0
Mambo	18.4	18.0	22.3
Masvori	6.0	5.0	12.0
Matinunura	7.1	7.8	15.8
Mavuzhe	11.1	50.0	13.2
Mdubiwa	9.5	6.1	4.5
Mkoba 1	13.3	16.0	19.6
Mkoba 3	7.7	26.0	30.4
Nhlangano (Mkoboli)	8.0	6.9	11.0
Ntabamhlope	25.0	16.7	19.7
Senga	14.3	5.9	15.3
Sibomvu	9.8	16.6	14.5
Vungu	11.1	16.7	30.3

The figures in Table 1 clearly show that the average pass rate for the three years for most of the schools is less than 20%. Although the performance percentages shown in the table only cover the three years that one of the researchers has been teaching in the district, the whole picture portrays a generally low performance rate by all day secondary schools in mathematics examinations. It is against this background that the researchers decided to carry out a research in order to investigate the possible causes of this poor performance in mathematics by students in day secondary schools in Gweru District.

RESEARCH METHODOLOGY

This study employed the use of the Descriptive Survey method as the main research design. A descriptive survey, according Grimes and Schultz (2002) "…determines and reports the way things are." This means that it describes the type/nature of the situation as it exists at the time of the study. Casadevall and Fang (2008) describe a descriptive survey as a method of collecting information directly from people about different aspects such as their feelings, beliefs and their personal background. Basically, a descriptive survey involves collection of data in order to answer research questions concerning the subject of the study. The population from which the study was drawn was defined as all the 20 day secondary schools in Gweru district. The study categorized the day secondary schools as Rural Day Secondary Schools (D), Commercial Farm Day Secondary Schools (CFD) and Urban Day Secondary population of the study Schools (UD). The population of the study included a total of 70 Mathematics teachers. The sample consisted of ten mathematics teachers and ten mathematics Heads of Departments (HOD) from the 10 selected schools.

Purposive convenience sampling was adopted in the selection of participants for this study. This type of non-probability sampling method seeks information-rich cases which can be studied in depth (Patton 1990). Since school teachers were scattered all over the district, convenience purposive sampling was employed in order to come up with the actual participants for this study. The questionnaire was used to collect data. The data was presented on frequency tables for synthesis and analysis to be simple. Data was presented in numbers which were expressed as percentages to necessitate comparisons so as to facilitate interpretation and discussion of data.

RESULTS AND DISCUSSION

Largely, schools had a good supply of resource books for teachers as shown in Table 2. Five (50%) 0f the schools said they used 2 to 3 resource books and 5 (50%) said they used 4 to 5 resource books for planning and setting pupil's work. HODs confirmed the situation on resource books although there is a slight variation in the numbers. These findings on the resource books for teachers seem to suggest that schools had a good supply of these books. This is consistent with Kalejaiye (2005)'s view that a variety of textbooks should be consulted by the teacher and pupils as they give different points of view.

Table 2: Perception of teachers and HODs on the availability of resource books for teachers and textbooks for pupils [Teachers (n=10)] [HODs (n=10)]

Resource books for teachers					*Textbooks distribution ratio*		
No. of books	*Teachers*		*HODs*		*Ratio*	*N*	*%*
	N	*%*	*N*	*%*			
					1 book per pupil	2	20
Only	0	0	0	0	1 book for 2 pupils	1	10
2-3	5	50	6	60	1 book for 3-5 pupils	3	30
4-5	5	50	4	40	1 book for 6-10 pupils	2	20
6 or more	0	0	0	0	1 book for 10 or more pupils	2	20
Total	10	100	10	100	Total	10	100

Table 2 also shows that 3 (30%) of the schools have a good sharing ratio of at least 2 pupils per book while 4 (40%) of the schools have a poor supply of textbooks where 6 or more pupils shared one book. Three (30%) of the schools have an average sharing ratio of one book for 3 to 5 pupils which does not enable pupils to derive maximum benefit from the textbooks. The information in Table 3 seems to suggest that there is a general shortage of textbooks for pupils and many of these shortages were reported from CFD and RD schools which have acute financial constraints. This confirms findings by Ale (2002) who holds the view that some pupils fail due to inadequate textbooks in

their schools. Commenting on textbook availability, Fagbamiye (2004) in his study revealed that inadequate supply of textbooks in schools is having a toll on teaching and learning activities in many of the countries in the world. According to him, the World Bank data recorded the number of student to a textbook as ratio 20: 1. Sodimu (1998) in his findings reported that based on the high cost of textbooks, many students have been unable to buy books that will help to promote the quality of education they receive in Lagos state public secondary schools. Textbooks as indicated by Oni (1995) are indispensable to the quality education and students' academic performance in all the schools in the world.

Table 3: Pupils' accessibility to library facilities [Teachers (N=10)] [HODs (N=10)]

Resp (T)	*N*	*%*	*Rep.*	*N*	*%*	*Resp.*	*N*	*%*
Yes	2	20	Yes	7	70	Yes	0	0
No	8	80	No	3	30	No	10	100
Total	10	100	Total	10	100	Total	10	100

HODs Responses

Dept. library			*Sch. library*			*Maths. room*		
Resp.	N	%	Resp.	N	%	Resp.	N	%
Yes	3	30	Yes	8	80	Yes	0	0
No	7	70	No	2	20	No	10	100
Total	10	100	Total	10	100	Total	10	100

Table 3 shows that only 2 to 3 schools (20%-30%) have departmental libraries and none of the schools have a mathematics special room. These are special facilities where mathematics resources such as reference books, mathematics magazine, mathematics games and models, to mention but a few are kept. The absence of such facilities is a handicap to the pupils. This is supported by Lance et al. (2002) who believe that shortage of essential materials such as textbooks has an adverse effect on mathematical education as a whole. Seven to eight (70% to 80%) of the schools indicated that they had school libraries from which essential resources could be got. Generally these libraries are well stocked in some UD schools but in some of the schools, especially CFD and RD schools, are not well stocked and most of them survive on donations of outdated books from overseas. This study's finding concurs with the study conducted by Lance (2002) which show that school libraries can have a positive impact on student achievement. Lance's study demonstrates similar results to numerous international studies which show the positive relationship between professionally staffed school libraries and student achievement.

The study of the Texas school library system conducted by Smith (2001) addressed three questions: How do current library resources relate to state standards? What are the effects of school libraries on student achievement as measured by the reading portion of the state's standardized test, the Texas Assessment of Academic Skills (TAAS)? What library practices are found in the highest performing schools? This *Research Brief* focuses on the study's second objective. Smith (2001) surveyed 600 randomly selected Texas libraries (503 returned the surveys). By combining the survey results with data from the state's information management systems and economic data from the Federal Reserve Board, more than 200 variables were gathered for analysis. Although most of the variance in TAAS scores was attributed to socio–economic factors, Smith found school libraries to have a measurable effect on student achievement. At the elementary and middle school levels, approximately 4 percent of the variance in TAAS scores was attributed to school libraries, while that figure more than doubled at the high school level, reaching 8.2 percent.

Table 4 shows that 10 (100%) of the teachers agree that textbook availability enhances pupils performance. The implication here is that if teachers and pupils have an adequate supply of textbook, then there is likely to be an improvement in students' performance in mathematics. These findings are consistent with Lance (2002) who stressed that availability of textbooks is one of the most important factors that influence academic performance. These results, therefore, seem to suggest that if there is a shortage of textbooks then pupils are likely to perform poorly in mathematics. Commenting on

Table 4: Views of teachers on the notion that text-books availability enhances pupil's performance in mathematics [Teachers (N=10)]

Response	*N*	*%*
Strongly agree	4	40
Agree	6	60
Disagree	0	0
Strongly disagree	0	0
Total	10	100

textbook availability as it affects achievement, Shumba (1988) postulated that " apart from the old case——and some streamed classes—it appears that there is a positive relationship between textbook availability and pupil achievement." In a study carried out in Nigeria by Ale (2000), sixty percent of the students interviewed indicated that they performed badly in mathematics because there were inadequate textbooks in their schools. The importance of textbooks in the teaching of mathematics cannot therefore be overemphasized.

The study set out to examine the rate of use of teaching aids by teachers and the types of aids used in schools. The findings are illustrated in Table 6.

Table 5: The influence of teaching aids on pupil performance in mathematics [Teachers (N=10)]

Rates of use of teaching aids			*Common teaching aids used*			
Responses	*N*	*%*	*Types*	*Total*	*N*	*%*
			Chalkboard	10	10	100
Frequently	2	20	Charts	10	5	50
Occasionally	6	60	Models	10	4	40
Rarely	2	20	Filmstrips	10	0	0
Never	0	0	Any other	10	0	0
Total	10	100	Total	10	0	0

Table 5 indicates that 2 (20%) of the respondents use teaching aids frequently in their lessons, while 6 (60%) occasionally use them and 2 (20%) rarely use them. Table 6 shows that all the 10 respondents (100%) use the chalkboard frequently as an aid. Charts are used occasionally, models are rarely used and film strips are not used at all. These results suggest that many teachers in the study sample occasionally use teaching aids in their lessons. Use of teaching aids requires adequate preparation by teachers. It would seem many teachers shun this preparation and resort to the chalkboard as the only aid, which in most cases is not well utilized. These results confirm Lance et al. (2002) whose study found that few teachers regularly use audio-visual aids in their lessons. Given the importance of teaching aids in the learning of mathematics, their absence would really 'retard' the rate of understanding of mathematics concepts which may eventually lead to poor performance in the subject.

According to Howard Gardner's Theory of Multiple Intelligences, students learn in a variety of ways, including through listening. Some students are better auditory learners than others and may see more academic improvement when using audio in the classroom. You will serve your students best if you instruct to all intelligences, as all students learn differently (Stringer 2008). Using audio in the classroom is one way of achieving this. Rather than relying solely on speech through direct instruction, include listening activities around music, noises and interactive listening assignments. It is well known among educators that, the educational experiences involving the learner actively participating in concrete examples are retained longer than abstract experiences. Instructional materials add elements of reality by providing concrete examples to learning (Adeyemi 2008). Furthermore, Adeyemi asserts that many authors have written on the use of instructional materials both in teaching social studies and other related subjects in order to enhance teaching for desired social and behavioural change.

Information on teacher experience was based on the experience of the teacher in teaching Mathematics and in marking public examinations.

Table 6 shows that 2 (20%) of the teachers and 5 (50%) of the HODs, have been teaching mathematics for 10 years or more. Four (40%) of the teachers and 3 (30%) of the HODs have experience

Table 6: Influence of teaching experience on pupil performance in Mathematics [Teachers (N=10)]

Experience in teaching maths					*Experience in teaching o'level maths*					*Teaching experience at present school*		
Years	*Teacher*		*HOD*		*Years*	*Teacher*		*HOD*		*Years*	*Teacher*	
	N	*%*	*N*	*%*		*N*	*%*	*N*	*%*		*N*	*%*
Less Than 1	0	0	0	0	Less than 1	0	0	2	20	Less than 1	2	20
1-4	4	40	2	20	1-2	3	30	3	30	1-2	3	30
5-9	4	40	3	30	3-4	2	20	1	10	3-4	2	20
10 or More	2	20	5	50	5 or more	5	50	4	40	5 or more	3	30
Total	10	100	10	100	Total	10	100	10	100	Total	10	100

in the category 1 to 4 years. There were no teachers with less than one year in the teaching field. This information shows that most of the mathematics teachers in the study sample have less than 10 years of teaching experience which means that they lack longer teaching experience. The present study seems to suggest that this lack of relevant teaching experience may have a negative bearing on pupil performance in mathematics since teachers won't be measuring up to expectance. The table also shows that 5 (50%) of the teacher been teaching 'O' Level mathematics for 5 years and more and 5(50%) of them have less than 5 years experience in teaching 'O'Level mathematics. However, HODs said that only 4 (40%) of the teachers have been teaching 'O'Level mathematics for 5 years or more and 6 (60%) of them have experience of less than 5 years at the same level. It is assumed that the longer a teacher takes in teaching 'O'Level classes, the more equipped he/she becomes with requisite techniques for success in examinations. It seems from the information given by HODs that most of the teachers have not yet got enough experience in teaching 'O'Level classes. Poor results at 'O' Level could be attributed to this lack of adequate experience in teaching 'O'Level mathematics. This confirms findings by Shumba (1988) who said that a significant number of teachers in Zimbabwe lack longer teaching experience which implied weaker practical instructional skills.

Table 6 also shows that 2 (20%) of the teachers have stayed at their present school for less than 1 year, 3 (30%) of them have stayed for one to two years 2 (20%) of them for 3 to 4 years and 3 (30%) of them have stayed for more than 5years. This information indicates that most of the teachers have had less than 5 years at their present schools and this is most prevalent in RD and CFD schools. The constant change of teachers adversely affects the performance of pupils and this might partially explain why there are poor results in 'O'Level mathematics at such schools. These results confirm similar studies conducted by Armstrong (2009). Armstrong's study found that teachers who have specialized in the subject which they teach or in the education of that subject at university, as well as teachers with between 26 and 30 years of teaching experience influence student performance positively. Adeyemi (2008) also conducted a similar study which revealed that teachers' teaching experience was significant with students' learning outcomes as measured by their performance in the SSC examinations. Schools having more teachers with five years and above teaching experience achieved better results than

Table 7: Responses of teachers on the different types of teaching methods [Teachers (N=10)]

Rating	*Guided discov.*		*Expos*		*Qu.and Ans.*		*Lect.*		*Group work*		*Hands on activ.*		*Field trips*	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
1. Never	0	0	0	0	0	0	5	50	0	0	2	20	7	70
2. Rarely	2	20	0	0	0	0	4	40	0	0	4	40	2	20
3. Occas.	**6**	60	4	40	0	0	1	10	5	50	4	40	1	10
4. Freq	2	20	6	60	10	100	0	0	5	50	0	0	0	0
Total	10	100	10	100	10	100	10	100	10	100	10	100	10	100

Key to Abbreviations used in Tables 7 and 8.
Discov: Discovery Expos: Exposition Qu and Ans: Question and answers
Lect: Lecture Actic: Activity Occas: Occasionally Freq: Frequently

Table 8: Rating of methods of teaching used by teachers as viewed by H.O.Ds

Rating	*Guided discov.*		*Expos*		*Qu.and Ans.*		*Lect.*		*Group work*		*Hands on activ.*		*Field trips*	
	N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*
1. Never	0	0	0	0	0	0	0	0	0	0	2	20	9	90
2. Rarely	1	10	0	0	1	10	3	30	1	10	6	60	1	10
3. Occas.	4	40	4	40	1	10	5	50	7	70	1	10	0	0
4. Freq.	5	50	6	60	8	80	2	20	2	20	1	10	0	0
Total	10	100	10	100	10	100	10	100	10	100	10	100	10	100

schools having more teachers with less than five years teaching experience.

The following methods were indicated as frequently used by teachers in mathematics lessons: Question and Answer 10 (100%) – teachers and 8 (80%) –HODs; Exposition 6 (60%)- both teachers and HODs; Guided Discovery 5 (50%)- HODs; and Group work by 5 (50%) of the teachers. Teachers have indicated less use of the lecture method while HODs said that 2(20%) and 5 (50%, frequently and occasionally use it. The methods indicated as not commonly used were: Hands on Activity where 60% -80% rarely or never used it; and Field Trips where 90%- 100% of them rarely or never used it.

It would seem that the most frequently used methods, are: Question and Answer, Exposition, Group work and Guided Discovery. These findings are consistent with findings by Jaji (1991) who said that the commonly used methods are question and answer, work from the text book and teacher demonstration. Expository methods were castigated for being teacher centered. The current study also noted that the least used methods were Field Trips and Hands on Activity which are very beneficial methods to pupils if used properly as they are pupil-centered. This is also confirmed by Shumba (1988) who found a high positive relationship between methods used and pupil performance. Poor results in mathematics in this respect could be attributed to the use of teacher-centered methods which limit the pupils' ability to explore facts and to explore facts derive enjoyment of success from the activities.

According to Kember (2009), student-centered learning allows students to actively participate in discovery learning processes from an autonomous viewpoint. Students consume the entire class time constructing a new understanding of the material being learned without being passive, but rather proactive. A variety of hands-on activities are administered in order to promote successful learning. Unique, yet distinctive learning styles are encouraged in a student-centered classroom. This is supported by Estes (2004) who postulates that with the use of valuable learning skills, students are capable of achieving life-long learning goals, which can further enhance student motivation in the classroom. Self-determination theory focuses on the degree to which an individual's behavior is self-motivated and self-determined (Iyoshi et al. 2005). Therefore, when students are given the opportunity to gauge their learning, learning becomes an incentive. Because learning can be seen as a form of personal growth, students are encouraged to utilize self-regulation practices in order to reflect on his or her work. For that reason, learning can also be constructive in the sense that the student is in full control of his or her learning. Over the past few decades, a paradigm shift in curriculum has occurred where the teacher acts as a facilitator in a student-centred classroom (Stringer 2008).

Such emphasis on learning has enabled students to take a self-directed alternative to learning. In the *teacher-centered* classroom, teachers are the primary source for knowledge. Therefore, the focus of learning is to gain information as it is proctored to the student. Also, rote learning or memorization of teacher notes or lectures was the norm a few decades ago. On the other hand, *student-centered* classrooms are now the norm where active learning is strongly encouraged. Students are now researching material pertinent to the success of their academia and knowledge production is seen as a standard. In order for a teacher to veer towards a student-centered classroom, he or she must become aware of the diverse backgrounds of his or her learners. To that end, the incorporation of a few educational practices such as Bloom's Taxonomy and Howard Gardner's Theory of Multiple intelligences can be beneficial to a student-centred classroom because it promotes various modes of diverse learning styles (Ester 2004; Iyoshi et al. 2005; Stringer 2008; Kember 2009).

Influence of Pupils' Attitudes Towards Mathematics on Their Performance in the Subject

The study set out to examine what attitudes pupils have towards Mathematics and how these influence their performance in the subject. The results are outlined in Tables 9 and 10.

Table 9 indicates that all teachers in the study sample were said to have positive attitude towards their pupils as shown by all the ten HODs (100%) who agree with the stated proposition. The results seem to suggest that mathematics teachers in the study sample do not induce fear of the subject in the pupils. All 10 teachers (100%) and all the 10 HODs (100%) agreed that many pupils have a natural fear of mathematics. This is consistent with findings by Trusty (2000) who cited some pupils who could not succeed in mathematics because of fear of the subject. This fear of mathematics, which

is referred to by Hanfi (2008) as 'Mathophobia', if entertained will lead students to have negative attitudes towards the subject. These negative attitudes will eventually cause students to perform poorly in mathematics. Since all the teachers in the current study agreed that pupils have a natural fear of mathematics it would imply that this fear of mathematics contributes to the poor performance by students in the subject at 'O'Level examinations.

Table 9: Perception of teachers and HODs on the attitudes of teachers towards pupils and pupils' fear of mathematics Teachers (N=10) HODS (N=10)

Teachers have a positive attitude towards pupils			*Many pupils have a natural fear of mathematics*				
Rating	*N*	*%*	*Rating*	*Teachers*		*HOD*	
				N	*%*	*N*	*%*
Strongly	5	50	Strongly	7	70	6	60
Agree	5	50	Agree	3	30	4	40
Disagree	0	0	Disagree	0	0	0	0
Strongly disagree	0	0	Strongly disagree	0	0	0	
Total	10	100	Total	10	100	10	100

Favourable pre-dispositions of students towards mathematics are expected to favourably influence their performance in the subject. This concurs with the results of a study conducted by Costello (2000), which found a positive correlation between secondary school students' attitudes towards mathematics and their achievement in the subject. This view is shared by Prince and Felder (2007) who assert that there is a common and reasonable belief that positive attitudes, particularly liking for, and interest in Mathematics lead to greater effort and in turn to higher achievement. Wilkins and Max (2008) add that the relationship between attitudes towards mathematics and ability in the subject is dynamic and interactive in that individuals with low ability in mathematics are more likely to have negative attitudes towards the subject and those with negative attitudes are less inclined to make the effort to improve their mathematical abilities.

Six (60%) of the teachers said pupils have an average interest in mathematics lessons while as low as 2 (20%) said that pupils have a high interest. All the 10 (100%) teachers said the pupils have an average to high rate of attentiveness in class. Four (40%) of the teachers said that pupils are not thorough in their written work while 6 (60%) rated thoroughness in written work as average to high. Eight (80%) of the teachers indicated that pupils are not willing to do extra work in mathematics and 9 (90%) indicated that pupils do not want to seek assistance from teachers.

It would seem from these results that pupils are relatively interested in mathematics, and they are attentive in class on average, they are also thorough in their written work on average. However, pupils are not willing to do extra work in mathematics and they do not want to seek help from teachers. Being unable to accept extra work and extra help from teachers seems to suggest that pupils do not really like mathematics and hence, they develop negative attitudes towards the subject. These negative attitudes towards the subject as revealed in the current study may be contributory factors to poor performance by pupils in mathematics examinations. In fact, pupils learn and that they will achieve better in mathematics if they like the subject. This tends to confirm findings by Trusty (2000) who said that there is a positive correlation between student's attitudes towards mathematics and their performance in the subject.

Future Strategies for Improving the 'O' Level Mathematics Results

The last question on the HOD questionnaire was open and required HODs to outline strategies

Table 10: Views of teachers on pupils' attitudes [Teachers (N=10)]

Interest in maths lessons			*Attentiveness in class*			*Thoroughness in from teacher*			*Willingness to do written work*			*Seeking help*		
Rating	*N*	*%*	*Rating*	*N*	*%*	*Rating*	*N*	*%*	*Rating*	*N*	*%*	*Rating*	*N*	*%*
1.Very low	0	0	1.	0	0	1.	0	0	1.	6	60	1.	6	60
2.Low	2	20	2.	0	0	2.	4	40	2.	2	20	2.	3	30
3.Average	6	60	3.	7	70	3.	5	50	3.	1	10	3.	1	10
4.High	2	20	4.	3	30	4.	1	10	4.	1	10	4.	0	0
5.Very high	0	0	5.	0	0	5.	0	0	5.	0	0	5.	0	0
Total	10	100	Total	10	100	Total	10	100	Total	10	100	T0tal	10	100

for improving 'O' Level mathematics results in their schools. The HODs submitted a wide range of issues which in their view would require the involvement of others in the system of Education- the school head, Regional Office and the Ministry's Head Office. Most of the HODs highlighted that schools should provide more textbooks for pupils. This is in agreement with the findings of the current study that there is a general shortage of textbooks in schools. Many of them also highlighted the need to have more revision lessons and more revision tests since they felt that pupils fail because teachers race to complete the syllabus without giving time for proper revision. The HODs also called for regular staff development workshops for mathematics teachers so as to improve their instructional skills and approaches. This also agrees with what came up in the current study that there was need for workshops to be organized for mathematics teachers to improve their teaching.

The HODs also highlighted that there should be improved supervision by school heads and Education Officers (E.Os) on mathematics teachers. They also suggested teachers should make an effort to motivate pupils to like mathematics. This agrees with the findings of the current study which indicated that pupils have a negative attitude towards mathematics. Finally, there was a call for the Ministry of Education, Sports and culture to revise the National Mathematics syllabus since the HODs thought it was rather tough for the average student.

CONCLUSION

This chapter presented, analyzed and discussed data collected through the use of questionnaires. A bar graph and frequency distribution tables were used to display data so as to simply analysis procedures. The main findings of the study are outlined below. The study established that there is a general shortage of mathematics textbooks for pupils in most of the day Secondary Schools. It was found out that many teachers do not use teaching aids frequently in their mathematics lessons and they do not vary their teaching methods to include some child-centered methods. The study also revealed that many of the teachers lack relevant experience in teaching mathematics at 'O'Level and in making public examinations. In addition, the study also revealed that there are very few workshops and staff development courses organized for mathematics teachers. Finally, all respondents were in agreement that many pupils fear mathematics and that many of them have negative attitudes towards the subject.

RECOMMENDATIONS

For schools to improve the pass rates of their students at "O" Level mathematics examinations, the following recommendations are made:

- Schools should make an effort to increase the number of textbooks in the stock. It is recommended that the Government through the Ministry of Education should allocate a greater percentage of per capita grant to the disadvantaged rural schools so that they can buy the much needed teaching/learning resources like textbooks
- Regular staff development workshops should be organized at regional, district, cluster and school level. This will assist teachers to be equipped with current teaching methodologies so as to improve their effectiveness and efficiency in lesson delivery.
- Teachers should make an effort to motivate pupils to develop positive attitudes towards mathematics and possibly remove the general fear of the subject. Mathematics can be made more enjoyable by varying teaching approaches and involving pupils greatly in learning activities so that they can gradually build self confidence in the subject.

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