

## Poor Performance of Pupils in Mathematics at Grade Seven Examinations in Farm Schools in Mrewa District of Zimbabwe

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**Abstract:** This present study's main focus was to analyse the causes of poor performance of pupils in Mathematics at Grade Seven examinations in farm schools in Mrewa District of Zimbabwe. The research used the quantitative research methodology and adopted the descriptive survey design. The target population included all primary schools in Mrewa District in Matabeleland Province in Zimbabwe. Random sampling was used to arrive at a sample of 200 respondents made up of 117 females and 83 males. All the information was collected through a questionnaire. The study revealed that there was a serious shortage of human, material, financial and in fractural resources that negatively impacted on pupils' performance in the Grade Seven Mathematics examinations. There was also a very high teacher turn-over due to the poor working conditions as well as political volatility in the environment. The study recommends that teachers should not be allowed to transfer during the course of the year to allow for continuity and stability in the teacher establishment.

**Keywords:** Causes, poor performance, pupils, grade seven examinations, farm schools and district

### INTRODUCTION AND BACKGROUND

The land reform programme in Zimbabwe unfolded from 2000 where large hitherto landless families from both communal and urban areas moved into the former white owned commercial farms [1]. These families moved in with their children of school going age. This movement spurred the establishment of satellite schools in the new settled areas [2]. As Langa [3] postulates, the birth of satellite schools was a stop-gap measure since the schools do not meet the expectations of conventional schools. The schools are just make-shift because they were not meant to be schools [3]. Kabayanjiri [4] observes that since the satellite or farm schools started as a temporary measure, appropriate infrastructure was a nightmare, old farm houses, tobacco barns, stables and sties were converted into learning and teaching venues. The children learning under these conditions in farm schools do the same curriculum as the rest of the children across the country. They also sit for the same ZIMSEC public examinations at the end of their primary school period. Every year all schools are obliged by the Ministry of Primary and Secondary Education to analyse their results from ZIMSEC examinations. The general trend is that the performance of Grade Seven pupils from the farm schools in mathematics in particular is very poor [5]. Mathematics is currently one of the major subject areas that students who wish to pursue higher education should be in possession of if the students fail the subject at primary school level, it means that they already are at disadvantage because they come to secondary schools with a very weak foundation of the

subject. It is on account of this information that the study set out to analyse the causes of this poor performance by pupils in farm schools.

### Statement of the problem

High failure rates of farm schools' children at Grade seven in mathematics is a very serious setback for the country's goal of providing mathematics education to all pupils in the country. With mathematics being a requirement for entry into all higher education institutions, the poor performance of pupils from farm schools in this subject means that they will be deprived of tertiary education, thereby perpetuating the cycle of poverty.

### Purpose of the study

Mathematics plays a critical role in laying a solid foundation for cognitive and scientific analysis of issues by pupils. The thrust of any education system is to promote mathematics teaching together with other science related subjects in order to promote technological advancement of society. It therefore becomes necessary to investigate challenges that contribute to poor performance of pupils in mathematics in order to come up with practical suggestions to mitigate the problem.

### Objectives of the study

- To identify teacher qualifications of maths teachers.
- To establish the magnitude of lack of resources for mathematics teaching and learning.

- To examine supervision trends for mathematics teaching.

### Research questions

To find answers to the main research question the study sought to find answers to the following questions:

- Are the teachers properly qualified to effectively teach mathematics?
- What is the extent of shortage of resources for teaching and learning of mathematics?
- Are heads of schools effectively supervising teachers teaching mathematics?

### REVIEW OF RELATED LITERATURE

The importance of having a solid background in mathematics is well recognized as it serves as a gateway to future professions in a variety of fields [6]. Mathematics is very important in our daily lives since it deals with real life situations in our daily activities [7]. A thorough understanding of mathematics is an asset if not essential, for applicants interested in obtaining better employment the world over [8]. Mathematics competence is an essential component in preparing numerate citizens for employment and it is needed to ensure the continued production of highly-skilled persons required by industry, science and technology [9].

Students need to be encouraged to acquire and be provided with the necessary academic skills to enter mathematics related professions [10]. Mastering mathematics has become more important than ever before in the world because students with a mathematics background have an advantage over those students who struggle when competing in the job market [3]. In the job market, workers who have a strong mathematics and science background are more likely to be employed and earn more than those with lower achievement [11]. Schools, therefore, must find ways to improve instruction and provide students with rich experiences in mathematics as they progress through the school system [12]. To produce a generation of students who can complete globally will require schools to prioritise the effective teaching of mathematics [13]. As Hill [10] argues, if not, then students are likely to repeat the cycle of poor learning experiences, inadequate foundational knowledge and skills, and weal educational outcomes in mathematics.

One factor that may affect a students' ability to succeed academically has been associated with low self- efficacy and lack of motivation [14]. Low self- efficacy causes motivational problems that hinder academic achievement and it is not surprising that many struggling learners have low self-efficacy for academics [12]. Therefore, students will avoid academics and give up quickly when faced with difficulties because they

believe that they lack the ability to succeed [13]. The link between socio-economic conditions and ineffective instructional strategies is another possible factor for poor performance of pupils in school work [11]. Economically disadvantaged students for example, are unlikely to be taught by properly qualified teachers due to the fact that teachers may shun their schools [3]. Students may therefore lack the commitment due to ineffective instruction.

According to Skemp [15], students develop mathematical anxiety in schools, often as a result of learning from teachers who are themselves anxious about their mathematical abilities in certain areas. Polya [16] on the other hand attributed poor performance in mathematics to parental attitude, interrupted teaching, poor teaching and dyscalculia. As Newton [12] argues, lack of meaningful library and laboratory, qualified teachers, home environmental factors and family backgrounds as well as little participation of parents in the education of their children are the main causes of poor performance in mathematics. Therefore, as Brown [13] states it is clear that the causes of poor performance in mathematics among school pupils are many and varied but they fall under school based causes, teacher and students personal causes. Causes like inadequate qualified teachers, instructional materials, libraries and laboratories, poor attitude of pupils, improper teaching methods, anxiety, home background, overcrowded classrooms, interrupted teaching, dyscalculia, poorly motivated teachers all contribute towards poor performance of pupils in mathematics.

Skemp [15] is of the opinion that mathematics performance of students can be improved by provision of properly qualified teachers, adequate learning materials, motivation of pupils, administration of more internal examinations and quizzes, using variety of teaching methods as well as monitoring of lessons by the school administration. Supervision is key to the professional development of teachers. As Miles [19] argues, effective school leaders visit classrooms to discover what is happening, they collect data through formal observations and instruments and use the data to help teachers with their teaching methodology.

Studies by Bush [17] revealed that absenteeism by both pupils and teachers contribute significantly to poor performance of pupils in mathematics. Where pupils had no meaningful reason to be at school, they frequently absented themselves from lessons to do other things they thought would be more productive to them. The other cause of poor performance by pupils in mathematics practical and exciting and this leads to negative attitudes to mathematics by students [18].

**RESEARCH METHODOLOGY**

The study employed the quantitative methodology. The quantitative methodology was found to be useful in this study because it enabled the researchers to investigate 200 teachers' perceptions regarding causes of poor performance of pupils in ZIMSEC Grade Seven examinations. The study settled for the survey descriptive design which enabled the researchers to gather widespread perceptions of the respondents on the phenomenon under review [20]. The study's population comprised of all teachers in Nyanga District Primary Schools. The simple random sampling technique was employed to select the respondents because it permitted every teacher in the district on equal opportunity of participating in the study [21]. The questionnaire was the main instrument for data collection. The researchers distributed the questionnaires to the various schools and collected them after two weeks. Permission to conduct the study was sought first before the questionnaire were distributed. Responded participated voluntarily and they were assured of anonymity and confidentiality.

**Date presentation and analysis**

The study set out to investigate the causes of poor performance of pupils in mathematics in the Grade Seven ZIMSEC examinations in Zimbabwe farm schools.

**Table 1: Distribution of respondents by sex (N=200)**

Sex	Frequency	Percentage
Male	83	41
Female	117	59
<b>Totals</b>	<b>200</b>	<b>100</b>

The table above shows that 59% of the respondents were female and 41% were male. This information reveals that the district is composed of more female teachers than male ones.

**Table 2: Composition of respondents by professional qualifications (N=200)**

Professional Qualifications	Frequency	Percentage
Untrained	30	15
Certificate in Education	60	30
Diploma in Education	100	50
Graduate Teachers	10	5
<b>Totals</b>	<b>200</b>	<b>100</b>

The majority of the respondents (85%) are in possession of a relevant professional qualification with the majority being Diploma in Education and Certificate in Education holders (80%). Those without

any form of professional qualification were 15% of the respondents.

**Table 3: Teachers who passed mathematics at 'O' Level or 'A' Level**

Possession of Mathematics	Frequency	Percentage
Yes	54	27
No	146	73
<b>Totals</b>	<b>200</b>	<b>100</b>

The majority of the respondents (73%) did not pass mathematics at either Ordinary level or Advanced level. Only 27% had the subject at either 'O' Level or 'A' Level.

**Table 4: Adequacy of mathematics textbooks and stationery**

Adequate textbooks and stationery	Frequency	Percentage
Yes	94	47
No	106	63
<b>Totals</b>	<b>200</b>	<b>100</b>

Table 4 above reflects that 63% of the respondents indicated that their schools had inadequate textbooks and stationery for mathematics. Those who had adequate textbooks and stationery were 47% of the sample.

**Table 5: Adequacy of classrooms**

Adequate rooms	Frequency	Percentage
Yes	12	6
No	188	94
<b>Totals</b>	<b>200</b>	<b>100</b>

The majority of the respondents (94%) indicated that the classrooms in their schools were inadequate. Only 6% stated that their schools had adequate classrooms. There is a serious shortage of classrooms in the farm schools.

**Table 6: Most common periods when mathematics lessons were allocated in the timetable**

Period	Frequency	Percentage
1 <sup>st</sup>	148	74
2 <sup>nd</sup>	42	21
3 <sup>rd</sup>	4	2
4 <sup>th</sup>	0	0
Last	6	3
<b>Totals</b>	<b>200</b>	<b>100</b>

Most respondents (74%) indicated that maths was always the first period in the morning, 21% stated that it was the second period and 3% said it was the last period.

**Table 7: Administration of mathematics tests**

Category responses	of	Frequency	Percentage
Weekly		6	3
Fortnightly		6	3
Monthly		20	10
Termly		168	84
<b>Totals</b>		<b>200</b>	<b>100</b>

Table 7 reveals that 84% of the respondents were giving pupils termly tests, 10% monthly and 3% fortnightly and weekly respectively.

**Table 8: Homework on mathematics**

Category responses	of	Frequency	Percentage
Daily		6	3
Weekly		12	6
Monthly		34	17
Not at all		148	74
<b>Totals</b>		<b>200</b>	<b>100</b>

Most respondents indicated that they were not giving their pupils homework to do at home (74%). Those who assigned homework tasks monthly constituted 17% and 6% and 3% assigned homework weekly and daily respectively.

**Table 9: Head’s frequency of supervision of mathematics lessons**

Category responses	of	Frequency	Percentage
Adequate		24	12
Inadequate		164	82
Not sure		12	6
<b>Totals</b>		<b>200</b>	<b>100</b>

Table 9 above shows that the majority of respondents indicated that their heads were not adequately conducting supervision sessions for mathematics lessons (82%). Only 12% thought that the supervision sessions were adequate. The remaining 6% were not sure whether the supervision was adequate or not.

The questionnaire had one open-ended question which sought to find out from respondents what other causes outside those listed in the closed questions contributed to poor performance of pupils in mathematics. The most common responses included the following:

- Absenteeism by pupils
- Late coming
- Lack of parental support
- Fear of the subject by pupils
- Poor foundation from lower grades

**DISCUSSION**

Most teachers in this study did not possess the mathematics subject at both Ordinary and Advanced levels in their academic certificates. The basic concepts they have on the subject were obtained from teacher training college where mathematics was taught for application in the classroom. Applied mathematics generally covers primary school content which may not be adequate for all concepts in the subject for someone doing it for the first time. This affects the confidence of the teachers as Skemp [15] states, students develop mathematical anxiety in schools often as a result of learning from teachers who are themselves anxious about their mathematical abilities in certain areas.

The schools understudy had inadequate textbooks and these few available textbooks were torn and missing many pages. Classrooms were not enough to accommodate all the pupils comfortably. Some of the pupils had to use makeshift structures or tree shades without a board nor furniture. This tallies with observations made by Kabayanjiri [4] when he said that since the satellite or farm schools started as a temporary measure, appropriate infrastructure was a nightmare, old farm houses, tobacco barns, stables and sties were converted into learning and teaching rooms.

Most teachers were having mathematics as the first period of the day. This they said was because they thought mathematics concepts were very abstract and required a fresh mind in the morning when pupils’ concentration span would be assured. However, the challenge with this set-up is that most of the pupils came to school late sometimes after two periods have gone, thereby losing out on the first two subjects of the day. This is due to the fact that some of the pupils walk long distances to the schools. As Ndebele postulates, most pupils in rural schools fail because they live very far away from schools; they wake up very early in the morning and arrive very late tired and exhausted to face the full wrath of both teachers and heads. This forces them to avoid school altogether.

The frequency of tests was too inter-spaced. Teachers largely relied on mid-year or termly tests to measure and evaluate the grasp of concepts by pupils. This means that during the course of the term teachers relied on very short exercises for the purposes of recording marks more than anything else. Regular tests in mathematics as in other subject areas are necessary because as Newton [12] argues, tests typically provide “a level” for the child’s mathematical skills; and in this case not just related grade level but also mathematics topic. Tests if properly used may boost student achievement by encouraging high achievers and offering remedial instruction, to those who are struggling [16].

School based supervisors were not prioritizing the supervision of mathematics lessons. Heads, deputy heads and TICs were not visiting teachers to observe them teach mathematics as frequently as they did with other subject areas. This compromises the quality of lesson delivery particularly in a situation where teachers are under qualified to teach a particular subject as is the case with mathematics in this study. As Mthethwa [11] postulates, the improvement of teaching and learning is the general purpose of supervision. Supervision as Hill [10] advises, is a process that focuses on instruction and provides teachers with information about their teaching so as to develop instructional skills to improve performance.

### CONCLUSIONS

Given the background of the above findings, the researchers make the following conclusions:

- Most teachers were not in possession of mathematics at either Ordinary or Advanced Levels.
- Classrooms were not enough to accommodate all the pupils and some of the pupils used unhealthy make shift structures.
- Mathematics is offered as the first period of the day in most classrooms.
- Very few tests were given to pupils on mathematics.
- School based supervisors were not prioritizing the supervision of mathematics lessons.

### RECOMMENDATIONS

In light of the findings of this study, the following recommendations are put forward.

- The Ministry of Primary and Secondary Education should introduce bridging courses in 'O' Level mathematics to enable teachers to sit for the 'O' Level public examinations.
- More resources in the form of classrooms and textbooks to facilitate effective teaching and learning of the subject should be provided.
- Mathematics should not always be the first subject in the time-table, teachers should vary the times because in the morning some pupils arrive late and miss out.
- Teachers should assign pupils more tests in order to help them revise and retain concepts in the subject.
- Heads of schools and other school based supervisors should prioritise the supervision of mathematics lessons in order to provide the professional guidance to the teachers.

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