FACTORS INFLUENCING STUDENTS' PERFORMANCE IN MATHEMATICS AT PUNTLAND SECONDARY SCHOOL CERTIFICATE EXAMINATION IN PUNTLAND STATE, SOMALIA

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DECLARATION

This research report is a result of my own independent effort and has never been submitted to any other institution for any award

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This research report is submitted for examination with our approval as University Supervisors

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This work is dedicated to my brother Abdulkadir Nur Salad, who was behind me all the way through my basic education.

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Above all, I thank the **Almighty God** who helped me throughout this process.

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ACRONYMS

KCSE	Kenya Certificate of Secondary Education
KNEC	Kenya National Examination Board
OECD	Organization for Economic Co-operation Development
PISA	Programme for International Student Assessment
PNEB	Puntland National Education Board
PSC	Puntland Secondary Certificate

ABSTRACT

This research aimed to examine factors influencing students' performance in mathematics at Puntland secondary school certificate examination in Puntland state, Somalia. The study was guided by four objectives: to assess how the teachers' professional qualifications in Mathematics affected students' performance in secondary schools in Puntland State, to establish how adequacy of teaching- learning resource materials in mathematics affected students' performance at secondary school, to assess how students' perceptions of their career development affected performance in Mathematics at secondary school and to establish how students' previous primary school achievement influenced their performance in Mathematics at secondary school. The study adopted the Education Production Function Theory by Schulz (1961). The study adopted a descriptive survey design targeting 20 supervisors, 25 head teachers, 45 teachers and 1099 students. Data was analyzed and presented in percentages, frequencies, graphs and tables. The study revealed that most of the teachers have necessary qualifications for teaching mathematics at secondary school level, but the methodologies they used were mainly teacher-centered. The study also found out that there is insufficient mathematics resource materials; a textbook: student ratio is on average 1:10 which does not favour students to do individual assignments in class or at home. The students' have high perception on the career development in mathematics; students perceived mathematics as important for their life. On the contrary, teachers, head teachers and most of the supervisors have the opinion that the students' have poor attitude towards mathematics because of their dismal performance. They all felt that students have weak foundation in mathematics. Further study of other factors affecting the students' performance and teaching methodologies is suggested.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Mathematics is a discipline that deals with the logic of shapes, quantities and arrangements. It helps us recognize patterns. It is a key to many subjects like technology, physics, biology and it is tool for specializations like engineering, and commerce. Mathematics produces solutions for complex real life problems. For these reasons mathematics performance in all academic areas should be considered vital to all learners. In order to improve the learners performance in mathematics, OECD administers PISA (Program for International Student Assessment) test, which is designed to measure whether students can apply what they've learned in school to real-life problems, in every 3 years to design appropriate strategies. The last programme survey was conducted in 2012. It was done in 65 countries and economies. On top of the result was Shanghai province while U.S. students lagged behind the average mark. Out of this 65 countries and economies only one country was from Africa, Tunisia which was ranked 59^{th} of these 65 countries and economies.

Mwenda, Nyaga, Muthas and Reche (2013) in Kenya have mentioned that the Kenyan secondary school students, particularly from those in Tharaka South District perform poorly in mathematics in the KCSE compared to other subjects. This was highlighted in their study "Factors contributing to students'

poor performance in mathematics in public secondary schools in Tharaka South District in Kenya." In this study, the significant factors that contribute to students' poor performance in mathematics include inadequate teaching and learning resources such as textbooks, inadequate teaching force, low entry marks at form one and students' negative attitude towards mathematics.

Historically Somali students are poor in mathematics since pre-war era as Mohamed (2006) mentioned in his research. Mohamed (2006) in his study on factors influencing students' performance in mathematics in Benadir region found that there is a difference in performance before and after the civil war. The performance was better before the war comparatively. In the study Mohamed also found that only three schools scored the mean scores of 39.7, 46.3 and 37.7 in 2004, 2005 and 2006 respectively in the centralized examination. Comparatively in Puntland the results for the last three years are 30.51, 23.44 and 22.09 showing a steady drop.

Education systems all over the world face challenges of secondary school students' poor performance in mathematics. Morris and Arora (1992) stated that the problem of students' poor performance in mathematics is not confined to anyone country but universal. Many countries of the world generally and particularly African countries are experiencing low level performances by students in mathematics in their annual examinations from the annual examination reports. In Kenya for example, the mean scores in KCSE mathematics in 2012 and 2013 were 28.66 and 27.58 respectively as reported

by The Kenya National Examination Council in their 2013 KCSE Examination Report. This problem is not limited to Kenya but Puntland is much worse. In Puntland, the mean score of mathematics examinations in 2012 and 2013 are 30.51 and 23.44 of the possible 100% respectively as Puntland national Examination Board reported in 2012 and 2013 in their examination reports. The low performance in mathematics at secondary schools in Puntland is a problem that needs to be addressed. From the report the individual grades for the years 2012, 2013, 2014 were as shown in table 1.1

Table 1.1 Performance in mathematics of Puntland secondary school graduates 2014, 2013 and 2012

Year	A	B	C	D	E	Total
2014	82	157	269	530	1480	2518
2013	75	161	262	516	1302	2316
2012	70	196	219	574	516	1575

These numbers show how poor Puntland secondary school graduates are performing in general secondary leaving examinations. In this table, grade E is a fail mark. The percentage of students who failed was, 59%, 56% and 33% in 2014, 2013 and 2012 respectively.

The studies have shown that students' performance in mathematics at secondary schools is poor. There must be factors affecting the performance of these students in mathematics. Olatunde (2010) cited in his study, in agreement with Birgen (2005) who asserted that experience and qualification of the teachers is a factor on students' performance. Therefore lack of trained teachers can be a problem.

Educational material resources influence students' performance as reported in the UNESCO report (2008). The report indicated that teaching/learning materials such as textbooks, classrooms, teaching aids (chalk, board, ruler and protractor), stationeries and laboratories affect academic performance of the learners. Also Mutai (2006) asserted that learning is strengthened when there were enough reference materials such as textbooks, exercise books, teaching aids and classrooms. Mohamed (2006) stated that the use of teaching resources in observed mathematics classes was very minimal.

In Puntland, the minister of education with support of Africa Educational Trust (AET) tried to identify the causes of poor performance of students in mathematics in 2011. A workshop was held in the ministry of education premises for 17 mathematics teachers from selected secondary schools. One of the objectives of this workshop was to identify the causes of low performance in mathematics in Puntland secondary schools. The causes of low performance in mathematics were identified as; poor foundation from primary schools, students belief that mathematics is a difficult subject, inadequate textbooks,

poor mathematics teaching methodology and no adequate teaching resources among others. In this workshop, it was noted that there was an alarming poor performance in mathematics in the form four Puntland examination results between 2007 and 2010. The data on the first four public schools' mean scores show these alarming results as can be seen in table 1.2.

Table 1.2 Students' performance in 2007–2010 form 4 in 4 public schools' at Puntland centralized examination

School	2007	2008	2009	2010
Omar Samatar	25.7	31.6	32	27.2
Gambol	11.7	16.4	16.3	27.2
Bosaso Public	14.2	20.6	21	14.4
Sh. Osman	11.4	9.6	12	16.4

These findings were revealed from the discussions of mathematics teachers in that workshop, but there was no study done to find out what are the real causes of these alarming figures.

As mentioned in this section many studies have been done on mathematics generally in other parts of the world on factors influencing students' performance in mathematics in secondary schools. Researchers in many different countries, in the world and in the region, investigated the causes of this problem. However, the studies have not examined performance in Somalia

and particularly in Puntland state. As there is no study about this topic done in Puntland and studies done in Somalia are not completely addressing the challenges in Puntland secondary school, there is then need to conduct this study in Puntland State of Somalia.

1.2 Statement of the problem

The need of enhancing students' performance in Mathematics is a priority for Puntland Ministry of Education as this subject is a key to science and technology and to development. Even though the performance in other science subjects are low, mathematics is the poorest performed subject in Puntland form four examinations from PNEB reports for the last 3 years as presented in table 1.3.

Table 1.3 Mean scores in mathematics, biology, physics and chemistry in 2012, 2013, 2014 in PNEB

Year	Mathematics	Biology	Physics	Chemistry
2014	22.09	42.37	35.52	40.72
2013	23.44	38.60	34.99	37.72
2012	30.51	49.96	39.91	35.9

All these subjects mean score is below 50% but mathematics is the lowest at all the times. This indeed shows that there is need of conducting study on this issue to find out the root cause of this problem.

The factors that influence secondary school students' performance in mathematics in Banadir secondary schools as found out by Mohamed (2006) were teacher characteristics, teaching methods, teaching resources, students' attitudes and other factors. These factors may affect Puntland students in different ways. The Banadir region students are evaluated in school based examinations while Puntland students go through centralized examinations. Puntland state conducted one workshop for mathematics teachers in 2011. One of the aims of this workshop was to identify the causes of the problem, however no other study has been conducted to verify this. Therefore there is need of research to be done to find out the factors influencing students' performance in mathematics at secondary school form four examination certificate level in Puntland.

1.3 Purpose of the study

The purpose of this study was to examine factors influencing students' Performance in Mathematics at Puntland secondary school certificate level in Puntland State of Somalia.

1.4 Research Objectives

The objectives that guided the study are:

1. To assess how the teachers' professional qualifications in Mathematics affect students' performance in secondary schools in Puntland State.
2. To establish how adequacy of teaching- learning resource materials in mathematics affect students' performance at secondary school.

3. To assess how students' perceptions of their career development affect performance in Mathematics at secondary school.
4. To establish how students' previous primary school achievement affect their performance in Mathematics at secondary school.

1.5 Research questions

In order to realize the objectives, the following research questions were used:

1. How do the teachers' professional qualifications in Mathematics affect students' performance in secondary schools in Puntland state?
2. How do adequacies of teaching- learning resource materials in mathematics affect students' performance at secondary schools in Puntland?
3. How do students' perceptions of their career development affect performance in Mathematics at secondary school?
4. In what ways does the students' primary school performance in Mathematics affect their Mathematics achievement at secondary school?

1.6. Significance of the study

There are no studies on this topic in Puntland according to the researchers' knowledge, therefore the findings of this study may be of great significance for Puntland ministry of education and secondary schools as it may them to offer solutions on perennial problems existing in Puntland education system.

The recommendations of the study may be adopted by teachers, school management and students to find strategies to improve the quality of education in Puntland. These study findings may inform further researches on this topic which may in turn help improve the school management and teaching/ learning processes in secondary schools.

The findings may also be useful to all Puntland secondary schools as the concerns in the study of the selected secondary schools are similar or same in all other secondary schools in Puntland. Educational planners may benefit from the study findings in a way that they may use the findings to plan for improved performance in mathematics.

1.7 Limitations of the study

This study focused on the factors influencing students' performance in mathematics in Puntland secondary schools with respect to teachers' professional qualifications, adequacy of teaching-learning resource materials, students' perception of their career development and students' primary school performance. There was a challenge with respondents as Somalis are oral society and were not comfortable to fill the questionnaires on time. To minimize this challenge, the researcher personally visited all selected secondary schools and pleaded with the respondents to complete filling the questionnaires.

1.8 Delimitations of the study

This study focused on Ministry of Education Quality Assurance, secondary school management, teachers and students in only four public secondary schools in the big cities of Puntland.

1.9 Assumptions of the study

The following were the assumptions of the study:

i. Students' performance in mathematics in secondary school certificate level is influenced by teachers' qualifications.

ii. Students' performance in mathematics in secondary school certificate level is influenced by adequacy of of teaching-learning resource materials.

iii. Students' performance in mathematics in secondary school certificate level is influenced by students' perception of their career development.

1.10 Definition of Significant Terms

The following are the significant terms that will be used in the study:

Career development is the process through which a person's work identity is formed. It is a major aspect of human development and it covers one's entire lifetime.

Mean score is the average mark of the students for that subject.

Performance refers to the grade that students achieve in examinations.

Professional qualification refers to a document which shows that someone has successfully finished a course of study which allows him/her to work in one of the professions.

1.11 Organization of the study

This project is organized into five chapters. Chapter one presents the background to the study, statement of the problem, purpose of the study, research objectives of the study, research questions of the study, significance of the study, limitations of the study, delimitations of the study, assumptions of the study, definition of the significant terms and the organization of the study. Chapter two presents relative literature reviewed giving attention to influence of teacher qualification, material resources, students' perception and students' primary school mathematics achievement to students' performance in mathematics in Puntland secondary certificate level. The chapter also encompasses theoretical framework and conceptual framework. Chapter three presents the research methodology. It deals with the research design, the target population, sampling techniques and sample size, research instruments, validity of the instruments, reliability of the instruments, data collection procedure and data analysis techniques. Chapter four presents the data obtained from the field, its analysis and interpretations and chapter five deals with the summary of the findings, conclusions and recommendations.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter focuses on the literature review related to the study. The chapter discusses the Influence of teachers' qualifications on academic performance, Teaching - learning resources materials on students' performance, Students' perception of their career development on their achievement and students' primary school performance on secondary school achievements. It also covers the theoretical and conceptual frameworks.

2.2 Influence of teacher's qualifications on academic performance

The quality of implementing mathematics programmes is ultimately determined by the teachers' performance and effective work in the classroom situation (Rukangu, 2000). Qualified teachers use different methods to enhance students' performance. Oseiwu (2013) cited in the study "Factors Affecting Academic Performance in Mathematical Sciences" that in a study conducted in Nairobi at the secondary schools by team of mathematics teachers in 2013, the major findings indicated that variation in mathematics performance was found to be significantly influenced by the type of teaching method. Hassana stated in this study that some teachers lack the patience to attend to students' questions in the class, because most of them are untrained teachers, they only know mathematics, but they lack methods of teaching and psychological willpower to mentor their students through guidance and counseling for better academic achievements. Teachers not only need

knowledge of a particular subject matter but also need to have pedagogical knowledge and knowledge of their students (Bransford et al., 2000). Mohamed (2006) in his study found out that 56.25% of Banadir region mathematics teachers were professionally qualified to mathematics and yet the examination results were poor, indicating that for an enhanced achievement in mathematics teachers need more than just a qualification. Teacher background characteristics and classroom instructional practices therefore do make a difference in students' academic achievement (Kimani, Kara, Njagi, 2013). There is a need to find out the effect of educational resources to students' performance.

2.3 Teaching - learning resource materials on students' performance

Educational materials play important role in achieving students' high performance in mathematics. Utilization of these materials makes mathematics easy to grasp and understand by learners. Generally, the use of teaching resources in the observed mathematics classes was very minimal (Mohamed, 2006). Olatunde and Otieno (2010) cited in their study "Teaching/Learning Resources and Academic Performance in Mathematics in Secondary Schools in Bondo District of Kenya" that Mutai (2006) asserted that learning is strengthened when there is enough reference materials such as textbooks, exercise books, teaching aids and classrooms, but also further asserted that academic achievement illustrates per excellence the correct use of these materials. This is needed to evaluate the effect of educational resources to students' performance.

2.4 Career development on students' achievement in schools

Students' perception of the subject is very crucial. We should identify and work on how their perceptions of what they learn and how they learn is set. If the institutions do not consider the importance of hearing what students think of their learning, the students' performance of any subject would not enhance. Therefore, this study will find out how the students' career development perception influences students' performance in mathematics. Suan (2014) has done study on "Factors Affecting Underachievement in Mathematics." In this study he revealed that there was a significant relationship between academic performance in mathematics and students' factors. In this study he cited the study of Brown, Brown and Bibby (2008) who found out that low participation of mathematics in UK was due to the perceived difficulties, lack of confidence, dislike, boredom and lack of relevance on the subject.

Tshabalala and Ncube (2013) stated in their study "Causes of Poor Performance of Ordinary Level Pupils in Mathematics in Rural secondary Schools in Nkayi District: Learner's Attributions" that 73% of their respondents in this study believe that mathematics is naturally a difficult subject. They cited in this study that Osafehinti (2009) posited, if a student has a positive attitude towards mathematics he/she will not only enjoy studying it but will also derive satisfaction from the knowledge of mathematical ideas he/she gains. In this study, they stated that according to Umameh (2011) there is need for genuine attitude change as it may bring about interest and positive attitudes towards the subject. They also asserted that this negative attitude is

partially created by teachers citing the following statements. Most of mathematics teachers do not make the teaching of mathematics practical and exciting and this leads to negative attitudes to mathematics by students (Salman, 2010). Some of the methods teachers used to teach mathematics did not help students develop conceptual understanding of mathematics (Nyaumwe et al, 2004). This study will find out the effect of students' perception to their mathematics performance.

2.5 Students' entry behavior on secondary school achievements

No one expects good performance in mathematics from students as long as their mathematics base is poor. When teaching mathematics it builds with a hierarchy of easy to hard to make the conceptual understanding easier. Any learner who has not covered the basics of mathematics thoroughly would get hard to grasp and understand the mathematical concepts. As reports from Puntland National Examination Board (PNEB) shows, the mathematics results are not as bad as those of form 4, but are below average in the recent years except 2014. The mean score of standard eight mathematics examinations in 2012, 2013 and 2014 are 46.8, 38.23 and 55 respectively. This is low when compared to science results of the same years which are 58.59, 63.30 and 56.76 in 2012, 2013 and 2014 respectively. Chege (2011), in Puntland secondary schools mathematics teachers' workshop report, one of the identified mathematics problems in secondary schools was "poor foundation from primary schools". This study would like find out how this factor affects

the students' performance of mathematics in Puntland secondary certificate level.

2.6 Summary of literature review

The reviewed literature has shown positive influence of teachers' qualifications on academic performance in mathematics. The reviewed literature revealed that there is a positive relationship between usage of teaching-learning resource materials and students' performance. It also shows students' positive perception and previous mathematical performance enhance students' performance in mathematics. The gaps filled by this study is that there are no enough studies about this topic done in Somalia and there is no study done in Puntland, therefore there was need of finding out the factors influencing students' performance in mathematics in Puntland secondary schools.

2.7 Theoretical framework

The study adopted the Education Production Function Theory by Schulz (1960). The production function was used to find out the maximum product from a combination of different inputs as a way of explaining the residual factor in the American rate of economic growth in the 1950s.

Educational production function is defined as follows:

$A = f(X_1, \ldots X_n)$

A … Output

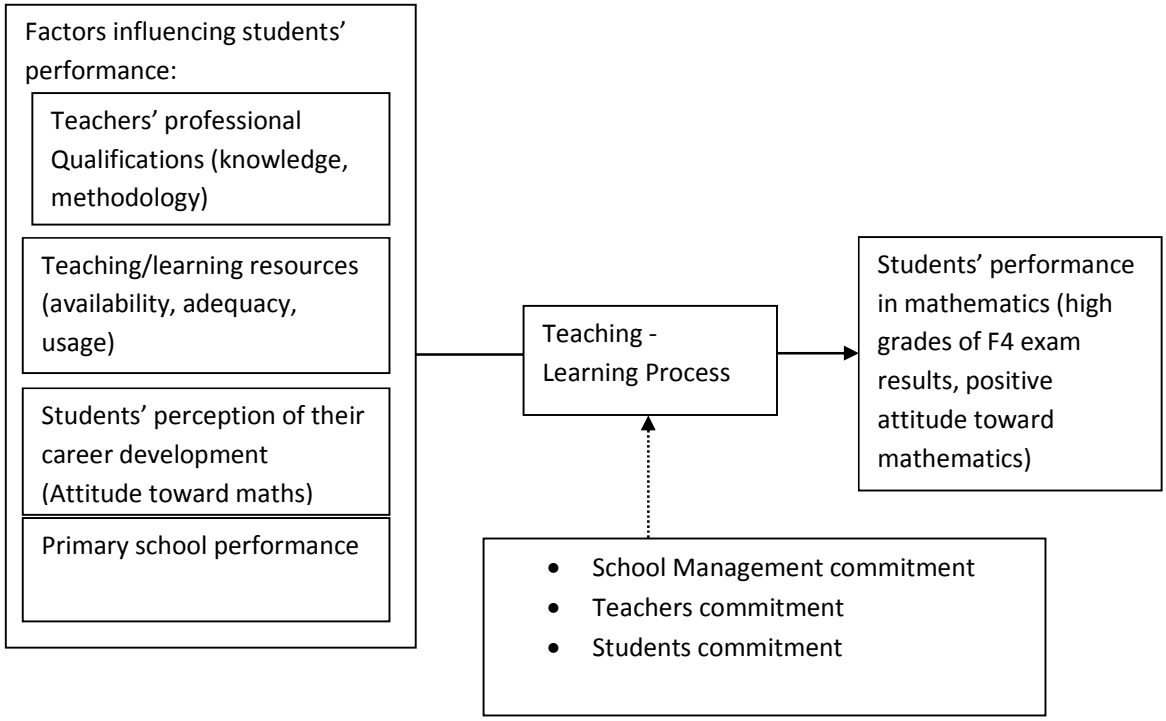
$X_1, \ldots X_n \ldots\ldots$ Input

In this case the dependent variable being "A" the output and independent variables being X_1, X_2, X_3 and X_4. The output, A, students' performance in mathematics is a function of X_1, X_2, X_3 and X_4, which are teachers' qualification, resource materials, students' perception and students' mathematical background are the inputs that influence the output, students' performance.

2.8 Conceptual framework of the study

Students' achievement, as an output, is produced by inputs in the educational process. The model of input-Process-Output is used in this conceptual framework.

Figure 2.1. Relationship between factors influencing students' achievement and students' performance in mathematics



The study conceptual framework is based on the variables used in the study. In this conceptual framework it is conceptualized that improvement of teachers' professional qualifications, increasing provision of learning-teaching materials, strengthening mathematics basis in primary schools, enhancing students' career development perception influences and improves students' academic performance in mathematics. The focus was on the factors influencing students' mathematics performance which are the central independent variables. These factors determined the end result of the study which is enhancing students' performance in mathematics.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used in the study. It includes research design, target population, sample size and sampling procedures, research instruments, validity, reliability and methods of data analysis.

3.2 Research Design

This study was carried out using descriptive survey design. This design involved acquiring information about one or more groups by asking them questions and tabulating their answers. Descriptive survey uses either questionnaire or interviews to collect data. A survey study can be used to assess personality variables such as attitudes and opinions about events, individuals or procedures. This design allowed the researcher to obtain and assess opinions, attitudes and practices. The goal of this design usually is to learn about a large population by surveying a sample of that population.

3.3 Target Population

The target population of the research study was 25 public secondary schools in Puntland. In this study, the target population was the 20 supervisors, 25 head teachers, 45 mathematics teachers and 1,099 form four students. *(Source: Puntland EMIS records 2014)*

3.4 Sampling Techniques and sample Size

The researcher selected 4 schools with largest populations and left out 4 schools with small populations from the 25 public secondary schools. The four big secondary schools were mainly public secondary schools operating in Puntland. The number of form four students in these 4 schools was 1,099 students, 390 students were randomly selected. Amin (2005) said that randomization is effective in creating equivalent representative groups that are essentially the same on all relevant variables thought of by researcher. Four head teachers and 20 mathematics teachers from these 4 schools were randomly selected whereas 6 supervisors were purposively selected from the ministry.

Table 3.1 Sampling techniques (Form 4 students)

School	Target Population	Sample Size	Sampling technique
A	174	100	Randomly selected
B	394	100	Randomly selected
C	365	100	Randomly selected
D	166	90	Randomly selected
Total	1099	390	

Source: schools records & secondary unit data (2015)

3.5 Research instruments

Field data was collected by the help of questionnaires, especially for students and teachers. The researcher personally conducted the data collection using

the questionnaires. The other instrument that was used for the data collection was interview schedule. This was used on the national supervisors, head teachers and one teacher from each school.

The questionnaires were found to be easily understood and filled with no difficult as they were self-explanatory. The researcher chose questionnaires as a data collection instrument because of their usefulness, reliable, and being able to generate useful information in a short period of time. Usually, questionnaires are used to obtain important information about a population; they are cheap and easy to administer (Mugenda and Mugenda, 2003). Questionnaires were explained, distributed and collected by the researcher.

The researcher interviewed selected supervisors, selected secondary school head teachers and one teacher from each of these 4 schools. The researcher chose the interview method in order to get thorough and complete information about the study topic. The interview was done by the researcher himself in order to show data validity and reliability.

3.6 Validity of the instrument

Validity is the degree to which the results obtained in a study represents the phenomenon being investigated. Content validity was guaranteed by the provision enough coverage of the topic under study. Content validity refers to the degree to which the content of the items reflects the content domain of interest (Miller, 2003). The researcher consulted with the supervisors of the

study to improve the validity of the instruments. The researcher also used friends, who are experienced in research instruments development, to proof read the instruments and advise on any changes that helped to increase the validity of the instruments.

3.7 Reliability of the instrument

Reliability of the instruments is defined as the measure of the degree to which a research instrument yields consistent results after repeated trials (Mugenda and Mugenda, 2003). The researcher used the test and re-test method by administering the same instruments twice to the same group with a time lapse of two weeks between the first and second tests. This involved administering the same instruments twice to the same group of respondents with a two week interval between the two tests. The two scores were then correlated to ascertain if the contents in the instruments are consistent in getting the same responses every time they were administered. The researcher used Pearson product moment correlation coefficient formula to measure the correlation. This is a measure of the strength of a linear association between two variables. It is denoted by r. The Pearson correlation coefficient, r, can take a range of values from +1 to -1. A value of 0 indicates that there is association between the variables. A value greater than 0 indicates positive associations while a value less than 0 indicates a negative association. Here comes the formula:

$$r = \frac{\Sigma(X - \bar{X})(Y - \bar{Y})}{\sqrt{\Sigma(X - \bar{X})^2 \, \Sigma(Y - \bar{Y})^2}}$$

Where:

r = Pearson's correlation coefficient

X = first set of results

Y = second set of results

A reliability of 0.8 was obtained which shows high reliability of the data. According to Mugenda and Mugenda (2003), a co-efficient reliability of 0.8 or more shows high reliability of the data.

3.8 Data collection procedures

The researcher used both the qualitative and quantitative approach of data collection. The researcher collected both qualitative and quantitative data from ministry of education quality assurance and standards directorate staff, head teachers, teachers and students of eight secondary schools in Puntland. Data collection was done by the researcher personally. The researcher received permission letters from ministry of education and the schools selected.

3.9 Data analysis

The researcher analyzed quantitative data from questionnaires by using simple frequencies and percentages. The researcher chose frequencies and percentages as they are easy to be compared, interpreted and understood. Qualitative data was analyzed using content or thematic analysis after which it is integrated in quantitative data.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This research focuses on factors influencing students' performance in mathematics at Puntland secondary school certificate examination in Puntland State, Somalia. In this chapter, the results of the study are presented, analyzed and discussed in the context of research objectives of the study and the research questions.

4.2 Questionnaire return rate

Questionnaires were given to 390 students and 20 teachers. The return rate of the questionnaire is shown in table 4.1.

Table 4.1: Questionnaire return rate

Category of response respondents	**Sample numbers**	**Frequency**	**Percentage by category**
Students	390	369	95%
Teachers	20	19	95%
Head teachers	8	8	100%
Supervisors	6	6	100%
Total	**424**	**402**	**98%**

Table 4.1 shows that 369 students out of 390 returned filled up questionnaires which make the return rate as 95%. For the teachers' questionnaires 19 out of 20 were filled and returned giving a return rate of 95%. The return rate of head teachers and supervisors interviewed are 100% each. This shows that the respondents' participation was very high, giving a high level of confidence in conclusions drawn.

4.3 Demographic information

4.3.1 Gender of respondents

In this study the students were asked to indicate their gender in the instruments provided. The findings are shown in figure 4.1

Figure 4.1: Gender of respondents

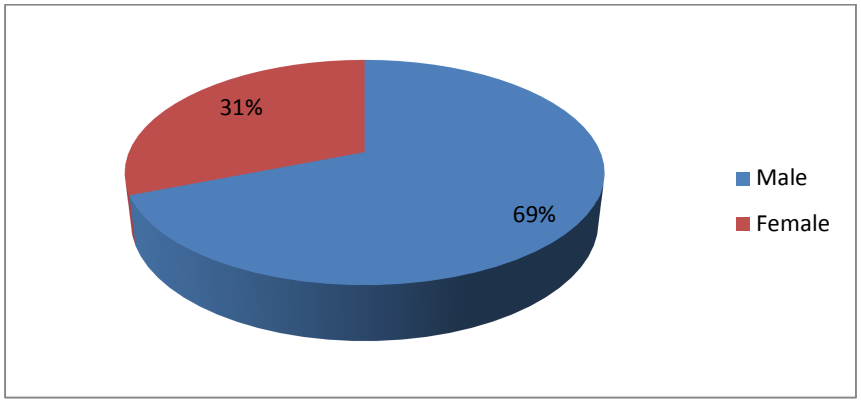


Figure 4.1 shows that 69% of the students are boys, which is normally the percentage distribution of students in Puntland secondary schools as the ministry of education and higher education statistics book shows. There are no female teachers, head teachers and supervisors that took part this study. The

reason being that there are no female form four math teachers, no female head teachers and no female supervisors in this targeted population.

4.3.2 Teachers professional qualifications

The teacher questionnaires in this study, teachers were required to write their highest level of educational qualification. Table 4.2 shows the highest academic qualifications for the teachers.

Table 4.2 highest academic qualification

Qualification	Frequency	Percentage
Diploma	5	26%
Bachelors	12	63%
Masters	2	11%

In this table 4.2, the highest academic qualification for the teacher respondents is noted. The largest number of teachers that took part in the study had the first degree in education at 63% as shown in this table. This indicates that the teachers are qualified to handle the content in secondary schools.

4.3.3 Teachers work experience

The work experience of the teachers in this study is captured in the questionnaires as shown in table 4.3.

Table 4.3 Teachers work experience

Working Experience	Frequency	Percentage
Less than 2 years	3	16%
2- 5 years	5	26%
6 – 10 years	10	53%
Over 15 years	1	5%

Table 4.3 shows that the majority of the teachers, 53% have working experience of 6 to 10 years which allow them to provide quality teaching and learning instructions.

4.4 Data Analysis as per the Objectives

This section presents data analysis on factors influencing students' performance in mathematics at Puntland secondary school certificate examination in Puntland State, Somalia.

4.4.1 Teacher Qualifications

Research Question 1: How do the teachers' professional qualifications in Mathematics affect students' performance in secondary schools in Puntland state?

Students, teachers, head teachers and supervisors were asked how the teachers' professional qualifications in mathematics affect students' performance in Puntland secondary schools. The students and teachers

provided their opinions through filled up questionnaires while head teachers and supervisors gave their opinions through interviews. The results of the findings are as follows:

4.4.1.1 Findings from the students

In figure 4.2 students are asked to clarify whether the teachers are using their qualifications in teaching activities.

Figure 4.2 Teacher qualification

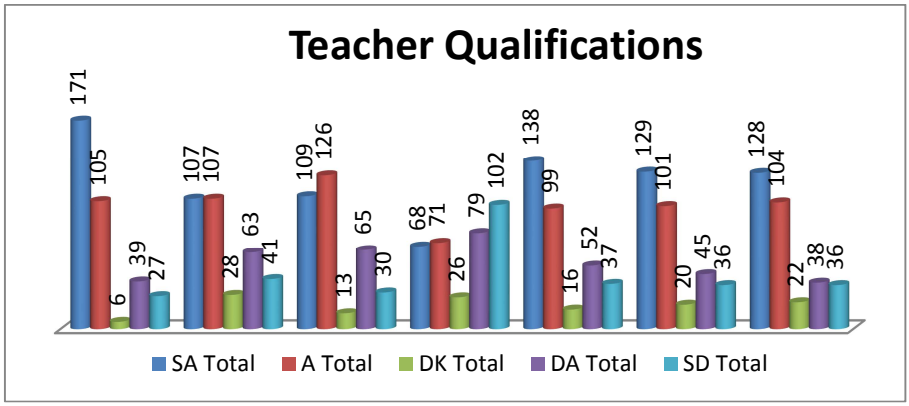


Figure 4.2 indicates how the mathematics teachers were scored using "strongly agree", "agree", "don't know", "disagree" and "strongly disagree" as tools on the following attributes:

- Explain the work well,
- repeat where it is not clear,
- answer questions thoroughly,
- respond rudely to students' questions,
- give homework, mark and return,

- help students when they are stuck and
- use different teaching methods.

When the students were asked whether their mathematics teachers explain the lessons well 171 out of 348 which is 49% of them strongly agreed that they explain lessons well. Over 30% of them think the teachers answer students' questions and make necessary clarifications when needed. They also believe that teachers use different methods in teaching and provide homework to students.

When asked if the teachers respond rudely to the students' questions 40% agreed or strongly agreed while 52% disagreed or strongly disagreed. The rest of the students did not know the teacher's behavior on these issues. When compared the male students with female students on this issues the results are almost the same regarding the percentage distribution of the two. As this figure shows the majority of the students believe that the teachers are relatively doing well in their teaching activities.

4.4.1.2 Findings from the teachers

In table 4.4 teachers were asked to evaluate the methods they applied in the teaching activities by using the words always (A), often (O), sometimes (S) and never (N). The percentages of their usage are as indicated in table 4.4.

Table 4.4 Teaching Methods used

Use	Always	Often	Sometimes	Never
Lecturing method	3	5	4	0
Small group discussion	0	5	7	0
Questioning method	6	4	2	0
Demonstration method	4	3	4	1
Problem solving method	4	4	4	0

Table 4.4 shows that 25% of the teachers always use lecturing in their teaching activities. The table shows that majority of the teachers work with individual students, check students' exercise books and allows students to think of solutions to practical problems.

The teachers interviewed gave a lot of valuable information. One of the teachers told the researcher that he should not bother to find out the teachers' qualifications as they are badly trained. He said that most of the teachers use lecturing method, thinking of only covering the syllabus without giving any consideration to students' performance. He said that he believes that the students are doing their best to study mathematics but reason goes back to the teachers who do not motivate students to perform well.

4.4.1.3 Findings from head teachers and supervisors

Most of the head teachers interviewed confirmed that the mathematics teachers have the qualifications needed to teach this subject. They also

confirmed that the mathematics performance of students is bad as their teachers are not using the appropriate methodologies in teaching mathematics; methodologies that are applicable to the lesson that is to be delivered, preferring use of lecturing method in most of their teaching times viewing it as the easiest way to deliver their lessons. Although they blamed students' mathematics foundation in early grades, the syllabus overload and students whom they said are not giving enough time and energy in studying mathematics; they also believe the ways of teaching mathematics in secondary schools is a part of the existing problem.

Supervisors interviewed confirmed that teachers are not using different methodologies of teaching and learning to enhance the performance of students in mathematics. One well experienced supervisor told the researcher that Puntland secondary mathematics teachers are using lecturing method over 80% of their teaching time. He said most of the students are not aware the importance of student-centered approach, so they are happy to teacher-centered approach being applied.

4.4.2 Teaching-learning Resource Material

Research Question 2: How do adequacies of teaching- learning resource materials in mathematics affect students' performance at secondary schools in Puntland?

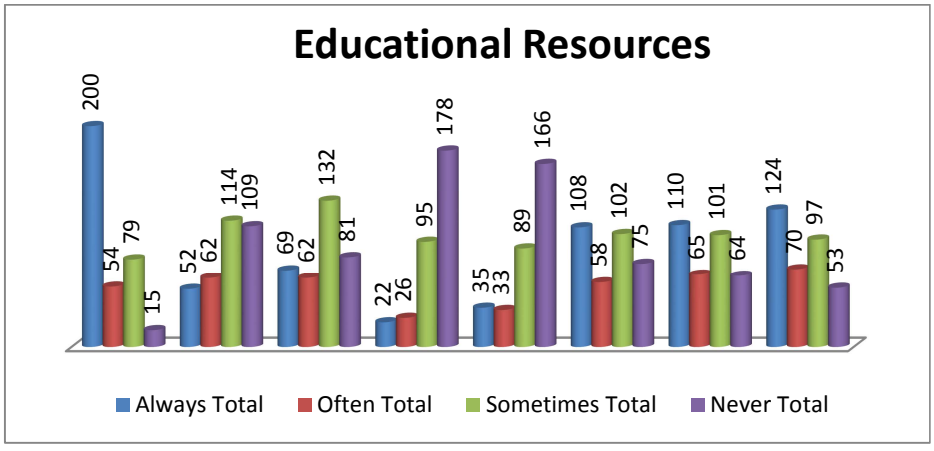
Students, teachers, head teachers and supervisors were asked how adequacies of teaching-learning resource materials in mathematics affect students'

performance at secondary schools in Puntland. The students and teachers provided their opinions through questionnaires while some teachers, head teachers and supervisors gave their opinions through interviews. The results of the findings are as follows:

4.4.2.1 Findings from students

In this study, the students were asked to indicate whether there were textbooks, charts, diagrams/models, projectors, computers, calculators, compasses and rulers available for them. The responses were to be chosen from; always (A), often (O), sometimes (S) and never (N) depending on their availability. Figure 4.3 shows the responses on availability of these resource materials in schools.

Figure 4.3 Adequacy of resource materials



In figure 4.3, 42% of the students indicated that they sometimes get textbooks, which shows that the availability of textbooks in these schools is limited. The other mathematical resources are not always used as indicated by figure 4.3.

The only mathematical instrument that students use is ruler. The least available items that are never or rarely used are computers and projectors as indicated in this figure.

4.4.2.2 Findings from the teachers

Teachers' questionnaire on resource materials used in mathematics class were reported as shown in table 4.5.

Table 4.5 Resources materials - teachers

Item	Always	Often	Sometimes	Never
Textbooks	25%	33%	42%	0%
Charts	0%	33%	25%	42%
Diagrams	8%	42%	42%	8%
Projectors	0%	33%	33%	33%
Calculator	17%	50%	25%	8%
Computers	0%	8%	33%	58%
Compasses	8%	25%	67%	0%
Rulers	58%	25%	17%	0%

According to the teachers' responses in this study, students use textbooks in class always as 25% of their teaching and learning times. This again shows from the teachers' perspective that the availability of textbooks is very limited.

This table also shows that the teachers never use computers most of their teaching times. Other mathematics resources like charts, models and diagrams are rarely used by the teachers in their teaching times.

The teachers interviewed indicated that there are no enough mathematics resource materials for the students. They particularly emphasized that there are no sufficient textbooks for their respective schools, the average ration for the school textbooks to students being 1:10 or over. The study showed that there are insufficient resource materials in the sampled schools.

4.4.2.3 Findings from the head teachers and supervisors

The head teachers interviewed unanimously took the view that mathematics resource materials are insufficient. They especially believed that textbooks are inadequate, the ratio being one textbook for ten students. They also mentioned that projectors and computers are not enough in the schools. Only one head teacher indicated that the school had enough projectors to use for class presentations. Another head teacher said that he organized students in groups of between 15 and 20 due to inadequate number of computers and other resource materials. He said that each group is provided one book for each subject.

The supervisors interviewed confirmed that teaching-learning resource materials are insufficient in schools. They said that textbooks are inadequate in the schools. The sharing ratio is one book to over ten students. One supervisor told the researcher that students do not have an opportunity to take with them

books home. He continued saying the limited textbooks that are available are used only in classes.

4.4.3 Students' Perception

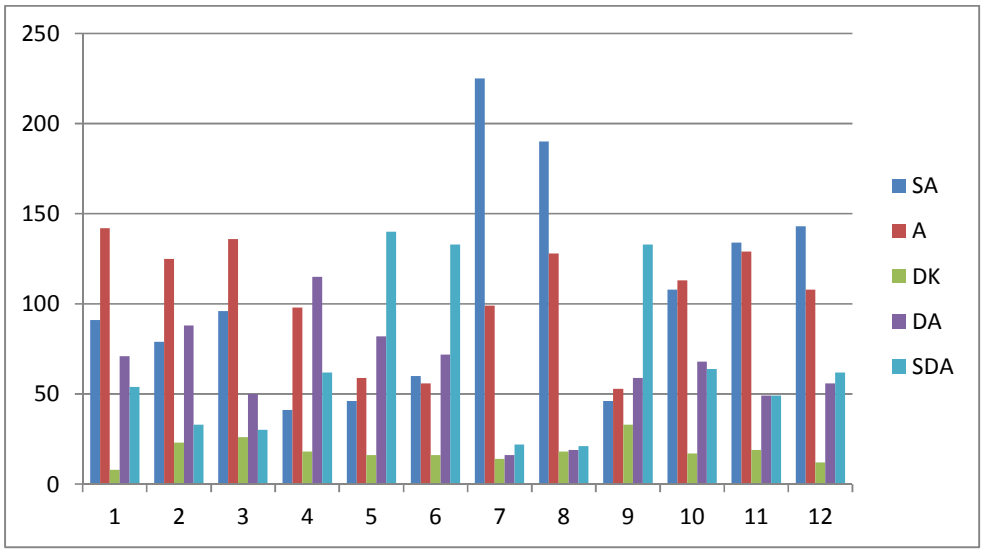
Research Question 3: How do students' perceptions of their career development affect performance in Mathematics at secondary school?

In this study, the researcher prepared a questionnaire to capture students' perception about mathematics as an important subject in their career development. The students were asked to give their opinion on this aspect in 12 statements in order to identify their perception of the subject. The statements were mainly how students' viewed mathematics in terms of:

1. too easy
2. fairly easy
3. about right level
4. quite difficult
5. very difficult
6. hated subject
7. useful in life
8. important for career development
9. boring
10. liked subject
11. understandable subject
12. well performed subject

The responses are recorded in figure 4.4 in details.

Figure 4.4: Students' Perception in Mathematics



This graph shows that 64% of students either strongly agreed or agree that mathematics is too easy. This shows that the students have a positive perception towards learning mathematics, so their low performance should not be related to their perception in mathematics.

When it comes to their opinions on whether mathematics was about right level, 68% either strongly agreed or agreed which again shows students' positive perception in mathematics.

In addition to that the students' views on how mathematics is difficult, 59% either strongly disagreed or disagreed to the assertion that mathematics is either quite difficult or very difficult. The findings indicate that students perceive mathematics as being right level and not very hard when it comes to difficultness. This also shows the positive attitude of students towards

mathematics which is totally different from the views of teachers and head teachers.

When students were asked whether mathematics is a hated subject, only 18% strongly agree that view which still shows positive perception of the students towards mathematics.

Students well noted that mathematics is useful in life and important for career development. Over 85% of them strongly agree or agree that mathematics is important for their career development. About that number also indicated that mathematics is useful for life. Majority of the students declared that the students' perception in mathematics is highly important for their career development and useful for their life.

Now let us see whether students perceive mathematics as boring subject, 59% of the students either strong disagreed or disagreed that mathematics is a boring subject. This shows that students perceive mathematics as a subject that they enjoy learning. Sixty percent of the students strongly agreed or agreed that mathematics is a subject they like doing more than any other subject.

In conclusion, the perception of the students towards mathematics whether it is important for career development, useful for life, fair, not hated, showed that there is positive perception of students towards the subject. Those students, who indicated, that they do not know their perception of mathematics were between 2% and 10% on all the items examined.

4.4.3.1 Findings from the teachers, head teachers and supervisors

In table 4.6 teachers' views on students' perception on mathematics is briefed.

Table 4.6: Teacher's Opinion on students' Math Perception

Word used	Frequency	Percent
Hard	3	50%
Difficult	4	38%
Normal	1	13%

Teachers interviewed unanimously perceived students' as having negative attitudes towards mathematics. The students' perceive mathematics as hard, boring and hated subject. To quote the exact words used by some of the teachers, the responses in table 4.6 shows how the 8 teachers interviewed expressed themselves towards students' perception on mathematics. As indicated in table 4.6 about 88% of the teachers interviewed think that students perceive mathematics as a hard subject that they could not study. It seems that teachers have the perception of mathematics is hard for the students which could be a legend believed in the past.

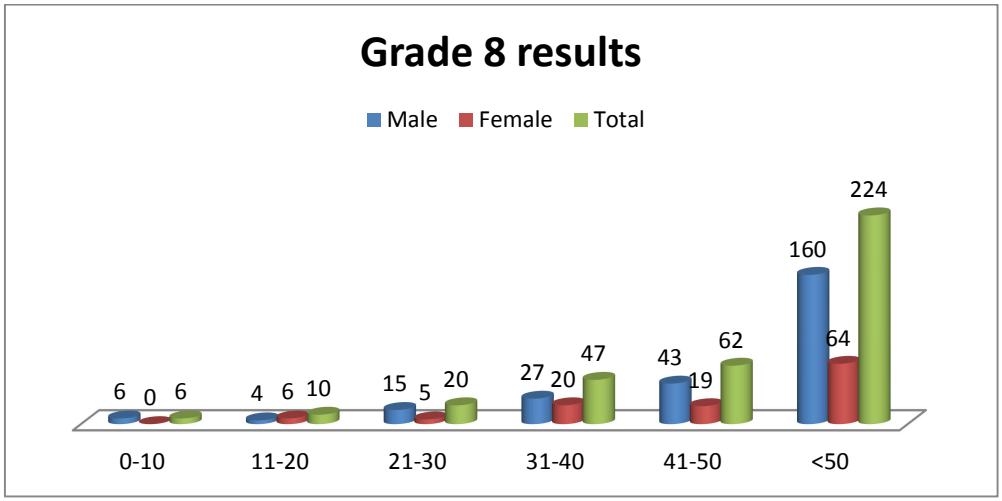
The 8 head teachers interviewed think that students perceive mathematics as a difficult subject and this is caused by students' low level of mathematics foundation in primary schools. Only two head teachers said that science students are different from arts students and may perceive mathematics as not hard subject.

Most of supervisors interviewed share the notion with the head teachers and teachers. However, at least 2 supervisors told the researcher that students' perception towards mathematics is positive and very high. These experienced supervisors blamed the teachers and head teachers that they are not addressing the issue by discussing it with their teachers and changing the teacher-centered methodology with student-centered methodology.

4.4.4 Mathematics Foundation

Figure 4.5 shows the students' responses on the question they were asked to provide the information about their background in mathematics at primary schools. The results in the last centralized examination are as reported in figure 4.5.

Figure 4.5: Grade 8 results



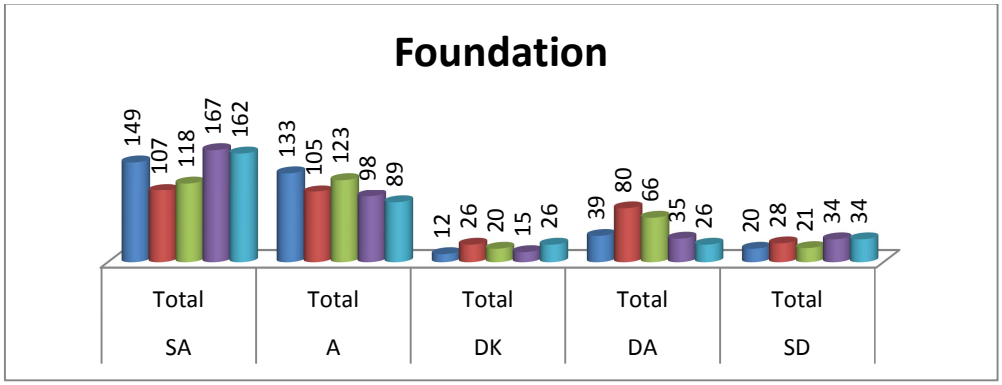
In this figure 4.5, 66% of the students got over 50% marks at primary school examination and 17% got between 41 and 50. Combined these 2 percentages gives about 80% of the students got over 41% and above. The required pass

mark is 40% therefore it can be concluded that the mathematics foundation of the students is not so bad. At the same time, students were asked to indicate the results they got in the latest test in the school. It is observed that 64% of them got 41% and over.

Apart from students' claims, the teachers also gave their opinions on the mean grade of students' in the latest test in their respective schools. The teachers indicated that the mean percentage mark in the latest mathematics test is 30%. This percentage is not very different from that given by the students. In general, students' background in mathematics is good and is likely to give them a head start.

Figure 4.6 presents the students' responses on the students' foundation in mathematics as captured in the questionnaire.

Figure 4.6 Students' response on the foundation in mathematics



Data in figure 4.6 shows students' responses on whether they were good in mathematics in their upper primary school. In this figure 42% of students strongly agreed that they were good in mathematics in their upper primary

school era. The majority of students indicated that they were good in mathematics in their primary schools which differs with the opinions of the teachers, head teachers and supervisors who believed that the students were poor in mathematics in their primary schools. Most of the students also said they liked mathematics, their teachers were qualified, and they liked their teachers.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section provides a summary, conclusions and recommendations of the study and suggestions for areas of further study.

5.2 Summary of the Study

The main aim of the study was to investigate the factors influencing students' performance in mathematics at Puntland secondary school certificate examination in Puntland State, Somalia. The study was guided by four objectives which were on; teachers' professional qualifications in Mathematics, adequacy of teaching- learning resource materials, students' perceptions of their career development and students' primary school and how these objectives influence students' mathematics performance.

The study adopted descriptive survey design with a sample of 390 students, 20 teachers, 8 head teachers and 6 supervisors. Data was collected using two questionnaires, one for students and one for teachers. Interviews were also used to capture information from 8 teachers, 8 head teachers and 6 supervisors.

5.3 Summary of study findings

The study found out that most of the teachers have qualifications needed for teaching mathematics, but methodologies used by the teachers are mainly teacher-centered as the head teachers and supervisors indicated.

The study also found out that resource materials needed for teaching mathematics are insufficient in the schools. For example textbook: student ratio was 1:10 and less. This showed that students do not take textbooks to do assignments or homework at home.

The students' perception on mathematics was positive. The students' perceived mathematics as important in their life and in their career development. They also indicated that the subject was neither difficult nor boring. On the other hand, teachers, head teachers and most of the supervisors were of the opinion that students' perception on mathematics was negative. They believe that students hate mathematics and that they found it as boring and unimportant subject in their lives. However, from the students' performance in the latest test it confirmed the position of students' opinions.

Students' mathematics foundation in early grades is low according to secondary school head teachers, teachers and school supervisors. The reason being teachers are not trained to enhance the performance of the young boys and girls. Supervisors, head teachers and teachers all agreed that the biggest problem lies in weak foundation of mathematics. But on the other hand, majority of the students indicated in this study that performed well in their primary schools.

5.4 Conclusion

The study tried to examine the four objectives which looked at factors influencing students' performance in mathematics at Puntland secondary school certificate examination in Puntland State, Somalia. The factors were: Teachers qualification, Mathematics resource materials, Students' perception of mathematics and students' mathematics foundation.

From the findings of the study the researcher makes the following conclusions;

a. The teachers have the necessary qualifications but don't apply student-centered methodology which is inevitable for enhancing the students' mathematics performance.
b. The resource materials of mathematics are inadequate compelling students to be confined to teachers' notes.
c. Students' perception in mathematics is very positive leading them to be ready to study the subject, but teachers' perception on students and methodologies used made the students helpless.
d. The foundation of mathematics in early grades is weak due to untrained or badly trained teachers.

5.5 Recommendations

The following recommendations are made based on the findings of the study:

1. The ministry of education and higher education should address issues related to teaching and learning activities. They should train secondary

school mathematics teachers to change their attitude towards students performance in mathematics.

2. Enhance the provision of educational resource materials for secondary schools. Special intervention is to be organized to provide mathematics textbooks for public secondary schools.
3. The ministry of education and higher education should plan on how to strengthen the students' background in mathematics.

5.6 Suggestions for Further Research

Based on the findings of the study the researcher suggests the following studies to be carried out as a complementary to this study:

1. A study need to be done on the factors influencing students' mathematics performance other than the factors in this study, because there could be other factors influencing this problem.
2. This study was on secondary schools only, there is need to carry out a similar study on the students' mathematics performance in primary schools to make the necessary early interventions.
3. There is also need to carry out a study on how the teaching methodologies as a main factor influencing the students' mathematics performance at national examinations.

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APPENDICES

APPENDIX I

LETTER OF INTRODUCTION

Educational Administration &

Planning

University of Nairobi

The head teacher

_____ secondary school

Dear sir/madam

REF: INVITATION TO PARTICIPATE IN RESEARCH

I am a student at university of Nairobi currently pursuing a Masters' degree in Educational Planning. As part of my endeavor, I am required to carry out research on **"Factors influencing students' performance in mathematics at Puntland secondary certificate level in Puntland state, Somalia"**. Your school has been selected for the study. The purpose of this letter is to kindly request you to allow me to carry out the study in your school. The information you give will be only used for the purpose of this study and your identity will be treated with confidentiality. Please be honest in your responses and ensure that you do not give your identity. The information will be for the purpose of the study only.

Sincerely yours

Abdullahi Nur Salad

APPENDIX II

Students Questionnaire

Puntland secondary school students are performing poor in mathematics as form four leaving examination results are showing. This study intends to find out the factors that influence student‘s performance in mathematics, so that appropriate recommendations are done.

The information you provide will not be used in any way against you. The results will be treated as highly confidential and are for research purposes only. So you are kindly requested to answer the following questions as honest as possible.

Section 1a: General Information

Instruction: Please tick the best answer

1. Gender: Male ☐ Female ☐
2. My mean score in the last examination (test) this year is (Please tick the appropriate box):

0 – 10 ☐ 11 – 20 ☐ 21 – 30 ☐ 31 – 40 ☐ 41 – 50 ☐

over 50 ☐

3. My mean score in Grade 8 examination (test) was (Please tick the appropriate box):

0 – 10 ☐ 11 – 20 ☐ 21 – 30 ☐ 31 – 40 ☐ 41 – 50 ☐

over 50 ☐

Section 1b: Teachers' Professional Qualification

Below are different themes in mathematics. Show how strongly you agree or disagree by making a tick in the appropriate box

Table 1: Teachers' Professional Qualification

Mathematics teacher:	Strongly Agree	Agree	Do not know	Disagree	Strongly Disagree
explains the work well					
repeats where it is not clear					
answers questions thoroughly					
responds rudely to students' questions					
gives homework, marks and returns the next day					
helps students when they are stuck					
uses different methods					

Section 2: Teaching – learning material resources

Below are different items, select their appropriate use one for each item.

Table 2: Teaching-learning resources

I use:	Always (A)	Often (O)	Sometimes (S)	Never (N)
Text Books				
Charts				
Diagrams/ Models				
Projectors				
Computers				
Calculators				
Compass				
Ruler				

Section 3: Students' perception in mathematics

Below are different themes in mathematics. Show how strongly you agree or disagree by making a tick in the appropriate box.

Table 3: Students' Perception

Mathematics is:	Strongly Agree	Agree	Do not know	Disagree	Strongly Disagree
too easy					
fairly easy					
about right level					
quite difficult					
very difficult					
hated subject					
useful in life					
important for career development					
Boring.					
a subject that I like doing more than any other subject					
a subject that I understand its meaning of new concepts, words and formulae					
a subject that I am happy with its examination results					

Section 4: Primary School Performance

Below are different themes in mathematics. Show how strongly you agree or disagree by making a tick in the appropriate box

Table 4: Primary School Performance

In my upper primary,	Strongly Agree	Agree	Do not know	Disagree	Strongly Disagree
I was good in mathematics.					
Mathematics was one of my favorite subjects					
I used to get high marks in mathematics.					
I liked my mathematics teachers.					
Our mathematics teachers were qualified to teach mathematics.					

APPENDIX III

Teacher Questionnaire:

Puntland secondary school students are performing poor in mathematics as form four leaving examination results are showing. This study intends to find out the factors that influence student‘s performance in mathematics, so that appropriate recommendations are done.

The information you provide will not be used in any way against you. The results will be treated as highly confidential and are for research purposes only. So you are kindly requested to answer the following questions as honest as possible.

Section 1a: General information

Region: _____

a) What is your gender? Male ☐ Female ☐

b) What is your Professional Status? ☐ Trained ☐ Untrained ☐

c) What is your Academic Qualification? Secondary ☐ Bachelor ☐ Master ☐ Other ☐ Specify:

d) What is your Specialization: Major: ☐ Minor: ☐

e) What is your Teaching Experience? less than 2 years ☐

2 – 5 years ☐

6 – 10 years ☐ 11 - 15 years ☐ Over 15 years ☐

f) What is your students' mean score of the last mathematics examination (test)?

0 – 10 ☐ 11 – 20 ☐ 21 – 30 ☐ 31 – 40 ☐ 41 – 50 ☐

over 50 ☐

Section 1b: Teachers' Professional Qualification

Please tick the appropriate place, one tick of rating for each method.

Table 5: Teaching-learning Material Resources

I use:	Always (A)	Often (O)	Sometimes (S)	Never (N)
Lecturing Method				
Small Group Discussion				
Questioning Method				
Problem-solving Method				
Demonstration Method				
a strategy that students learn best by finding solutions to problems on their own				
to work with individual students				
to check my students' exercise books				
to allow students to think of solutions to practical problems themselves before the I show them how they are solved				

Section 2: Teaching/learning resources

Please tick the appropriate place, one tick of rating for each method.

Table 6: Teaching resources

I use the following items in class:	Always (A)	Often (O)	Sometimes (S)	Never (N)
Text Books				
Charts				
Diagrams/ Models				
Projectors				
Calculators				
Computers				
Compass				
rulers				

APPENDIX IV

Head Teachers Interview

Instruction: Please tick the best answer

Gender: Male ☐ Female ☐

Interview Questions

1. How do you perceive mathematics performance of your students?

_____

_____

_____

2. Do you think the following factors influence students' performance in mathematics in Puntland? If yes, how?

a. The teachers' professional qualifications:

_____

_____

b. Adequacies of teaching- learning resource materials:

_____

_____

c. Students' perceptions of their career development: _____

_____

_____

d. Students' primary school performance: _____

_____

_____

3. Do you provide the following teaching materials to the mathematics teachers and students?

a. Textbooks:_____

b. Mathematics

charts:_____

c. Campuses/rulers:_____

d. Calculators:_____

e. Projectors:_____

4. What is the ratio of mathematics textbooks to the students?

_____

5. How did your students perform in mathematics in their standard 8 examinations?

_____

_____

_____

6. How do your students perceive mathematics?

_____

_____

_____

APPENDIX V

Teachers Interview

Instruction: Please tick the best answer

Gender: Male ☐ Female ☐

Interview Questions

1. How do you perceive mathematics performance of your school?

   _____

   _____

   _____

   _____

   _____

2. Do you think the following factors influence students' performance in mathematics in Puntland? If yes, how?

   a. The teachers' professional qualifications:

      _____

      _____

   b. Adequacies of teaching- learning resource materials:

      _____

      _____

      _____

c. Students' perceptions of their career development:

_____

_____

d. Students' primary school performance:

_____

_____

3. Does your school provide the following teaching materials to the mathematics teachers and students?

a. Textbooks:

_____

b. Mathematics

charts:_____

_____

c. Campuses/rulers:_____

d. Calculators:_____

e. Projectors:_____

4. What is the ratio of mathematics textbooks to the students?

_____

_____

5. How did your students perform in mathematics in their standard 8 examinations?

_____

_____

_____

_____

6. How do your students perceive mathematics?

_____

_____

_____

APPENDIX VI

Quality Assurance and Standards Interview:

Instruction: Please tick the best answer

Gender: Male ☐ Female ☐

Interview Questions

1. Do you think Puntland secondary school students are performing well in mathematics?

_____

_____

_____

2. Do you think the following factors influence students' performance in mathematics in Puntland? If yes, how?

a. The teachers' professional qualifications:

_____

_____

_____

_____

b. Adequacies of teaching- learning resource materials: _____

_____

_____

c. Students' perceptions of their career development:_____

_____

_____

_____.

d. Students' primary school performance: _____

_____

_____

_____

3. How students in Puntland secondary schools perceive mathematics? _____

_____

_____.

4. Do the schools have adequate material resources for mathematics for both teachers and students?

_____

_____

_____

_____

5. Are these materials used properly?

_____

_____

_____

6. Do the teachers use appropriate teaching methods in schools?

_____

_____

_____