

**INFLUENCE OF SELECTED FACTORS ON ACADEMIC PERFORMANCE OF
STUDENTS IN SECONDARY SCHOOL AGRICULTURE, IN
RACHUONYO NORTH DISTRICT, KENYA**

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**A Thesis Submitted to the Graduate School in Fulfillment of the Requirements for the
Award of the Degree of Master of Science in Agricultural Education of
Egerton University**

EGERTON UNIVERSITY

DECEMBER, 2013

DECLARATION AND RECOMMENDATION

Declaration

This thesis is my original work and has not been presented for examination in any other University.

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DEDICATION

This task was by no means a “walk in the park”. It is with great pride that I dedicate this thesis to my wife, Quinter. You were always there for me during this research activity. You are my partner and friend. It is with your love and support that this task is now another chapter in our lives. You believed in me and for that I am grateful. To my children Phanice, Laura and Lucky, I would want to thank you for your patience, especially when I was absent from home during my academic pursuits. I also would like to dedicate this experience to my father and mother, Ben and Serphine Ogweno. You encouraged me through the process to keep going and reminded me that there is always a light at the end of the tunnel. Thank you for your support and understanding through this experience and for instilling a desire in me to never give up.

ACKNOWLEDGEMENTS

Successful completion of this study was made possible by many people with whom I have met along my academic journey. First, I want to thank my supervisors' Professor Nephath Kathuri and Dr. James Obara for their knowledgeable and helpful suggestions. Their profound commitment to improving this work and guiding it through to completion was unequalled. Additionally, this study could not have been successful without the support of Dr. David Amudavi of International Centre of Insect Physiology and Ecology whose support and guidance was instrumental to my academic success, especially during my proposal writing. I will always appreciate the quality learning experience at Egerton University and in particular The Department of Agricultural Education and Extension and the Graduate School.

I extend sincere thanks to Rachuonyo North District Education Officer who supported my educational pursuits, especially while collecting data of the past agriculture K.C.S.E examinations. I thank all the school principals, agriculture teachers and agriculture students in Rachuonyo North District who helped in filling in my questionnaires and thus supporting me during data collection. I want to thank my friends and colleagues who became personal friends as a result of my educational journey: Alfred Odhiambo, Paul Njogu, Kileon Obiero, Dismas Odula, Mahalon Oremo, Julius Nyang'or, Samwel Mugweru and Joshua Omollo for their help and advice, I am grateful to many people who have sustained my energy in writing this thesis. I could not have completed this academic pursuit without the assistance of my wife, Quinter, children and parents. In the course of this research and elsewhere over the years, I have benefited immensely from their unfailing love, encouragement, and enthusiasm. Lastly, to my brothers Tobias and James and friends, I do not have enough words to say thank you for being there for me all of these years. Without your constant support and encouragement, I would not be realizing a dream come true. You gave me strength and confidence and I am forever grateful.

ABSTRACT

Agriculture is the backbone to Kenya's economy. This fact justifies the need to integrate agriculture in the school curriculum, in order to equip the learners with problem-solving skills for self-sufficiency. Low performance of students in agriculture subject has become an issue in Rachuonyo North District, and therefore, factors influencing performance of the students needed to be understood, in order to seek practical ways of supporting the students to improve in their performance in the subject. The purpose of this study was therefore, to determine the influence of selected factors on academic performance of students in secondary school agriculture, in Rachuonyo North District. The study adopted a theoretical model of McClelland's Achievement Motivation Theory. The selected design for the study was co-relational design and stratified sampling was used to select schools for the study. The target population included 38 agriculture teachers and 9059 students. The sample size was 254 Form Four agriculture students and 30 agriculture teachers. The instrument was validated through pilot testing for comprehension and clarity while reliability of the instrument was tested using split-half method. Data was collected using two questionnaires, namely, for students and agriculture teachers, as respondents. Data was analyzed using qualitative and quantitative methods where descriptive statistics including frequencies, percentages, means, as well as, standard deviation were used, while inferential statistics included Pearson Correlation, Spearman's Rho, t-test, as well as, simple and multiple regression analysis were used to test the hypotheses, with levels of significance set at 0.05. Statistical Package for Social Sciences software was used for data analysis. The study found that availability of teaching and learning resources considered was not statistically significant as linear regression results yielded 0.123 which was higher than 0.05. Similarly, the study found that teachers' experience had a t-value of 3.172 which was greater than 1.96 with a significance of 0.04, which was statistically significant. Thus the second hypothesis was rejected. In addition, a positive correlation of 0.131 was found between family size and student's performance; however, multiple regressions results yielded -1.941, 1.569, -1.817, 0.205 and -0.948 respectively, which were all less than 1.96, hence, family characteristics did not have significant influence on students' performance. Teachers and policy makers should strengthen the use of demonstration and field trips as teaching methods as well as career guidance to enable students choose optional subjects that match their career objectives.

TABLE OF CONTENTS

DECLARATION AND RECOMMENDATION	ii
COPY RIGHT.....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENTS	v
ABSTRACT.....	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xiii
LIST OF ACRONYMNS AND ABBREVIATIONS	xiv
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the Study	1
1.2 Statement of the Problem	5
1.3 Purpose of the Study.....	5
1.4 Objectives of the Study	5
1.5 Hypotheses	6
1.6 Significance of the Study	6
1.7 Assumptions of the Study.....	7
1.8 Limitations of the Study	7
1.9 Operational Definitions of Terms.....	8
CHAPTER TWO	
LITERATURE REVIEW	10
2.1 Introduction	10
2.2 Availability of Teaching and Learning Resources and Students’ Academic Performance in Agriculture.....	10
2.3 Teachers’ Characteristics and Students’ Academic Performance in Agriculture	18
2.4 Students’ Characteristics and Academic Performance in Agriculture	22
2.5 Family Characteristics and Students’ Academic Performance in Agriculture.....	26

2.6 Theoretical Framework	30
2.7 Conceptual Framework	31

CHAPTER THREE

RESEARCH METHODOLOGY	33
3.1 Introduction.....	33
3.2 Research Design.....	33
3.3 Location of the Study.....	33
3.4 Population of the Study.....	33
3.5 Sampling Procedures and Sample Size.....	34
3.6 Instrumentation	37
3.7 Data Collection Procedure	39
3.8 Data Analysis	40

CHAPTER FOUR

RESULTS AND DISCUSSION	43
4.3. Availability of Teaching and Learning Resources and Students Academic Performance in Agriculture	43
4.4. Teachers’ Characteristics and Students Academic Performance in Agriculture	51
4.5. Students’ Characteristics and their Academic Performance in Agriculture	59
4.6. Family Characteristics and Students Academic Performance in Agriculture.....	66

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	85
5.1. Introduction.....	85
5.2. Summary of the Study	85
5.3 Conclusions.....	88

REFERENCES.....	90
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APPENDICES	116
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APPENDIX A: QUESTIONNAIRE FOR FORM FOUR STUDENTS	116
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APPENDIX B: QUESTIONNAIRE FOR AGRICULTURE TEACHERS	119
--	-----

APPENDIX C: MAP OF THE STUDY AREA	122
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APPENDIX D: RESEARCH PERMIT	123
APPENDIX E: LETTER OF RESEARCH AUTHORIZATION	124
APPENDIX F: LETTER OF RESEARCH AUTHORIZATION.....	125
APPENDIX G: LETTER OF RESEARCH AUTHORIZATION.....	126

LIST OF TABLES

Table 1: Poverty Levels in Rachuonyo North District.....	3
Table 2: Rachuonyo North District KCSE Agriculture Subject Performance (2007-2010).....	4
Table 3: Number of Schools per Division and Student’s Enrollment	34
Table 4: Number of Schools per Division and Enrollment in Agriculture	37
Table 5: Summary of Data Analysis.....	42
Table 6: Responses on the Availability of the Laboratory	44
Table 7: Comparing Availability of Laboratory and Performance in 2012 Mock Examination ...	45
Table 8: Agriculture Teachers Responses on Availability of Classrooms	46
Table 9: Comparing Teachers Responses on Classroom Availability and KCSE average Mean Score (2009-2011)	46
Table 10: Agriculture Students Responses on Availability of School Farm	47
Table 11: Comparing Availability of School Farm and Students Performance in 2012 Mock Examination	47
Table 12: Agriculture Students Responses on Availability of Agriculture Textbooks	48
Table 13: Comparing Availability of Agriculture Textbooks and Students Performance in 2012 Mock Examination.....	48
Table 14: Agriculture Students Responses on Availability of Farm structures.....	49
Table 15: Comparing Availability of Farm structures and Students Performance in 2012 Mock Examination	49
Table 16: Agriculture Students Responses on Availability of Library.....	51
Table 17: Comparing Library Availability and Students Performance in 2012 Mock Examination	51
Table 18: Gender Distribution of the Agriculture Teachers	52
Table 19: Age Distribution of Agriculture Teachers	52
Table 20: Comparing Age of the Teacher and KCSE Average Mean Score (2009-2011).....	53
Table 21: Highest Professional Training of the Agriculture Teachers	54
Table 22: Comparing Teacher’s Training and KCSE Average Mean Score (2009-2011).....	54
Table 23: Agriculture Teachers Teaching Experience.....	55
Table 24: Comparing Age of the Teacher and KCSE Average Mean Score (2009-2011).....	55
Table 25: Teaching Method Compared to Performance of Students in KCSE 2009-2011	57

Table 26: Teachers’ Attitudes toward Teaching Agriculture	58
Table 27: Student’s Respondents Age	59
Table 28: Career Preference of the Student Respondents.....	60
Table 29: Career Choice and Performance of Students in 2012 Agriculture Mock Examination in Rachuonyo North District.....	61
Table 30: Gender of the Student Respondents.....	61
Table 31: Mean Performance of Students per Gender in 2012 Rachuonyo North District Agriculture Mock Examination	62
Table 33: Preferred Study Times and Performance in 2012 Agriculture Mock Examination in Rachuonyo North District	64
Table 34: Class Attendance and Performance in KCSE Agriculture Examination (2009-2011) ..	65
Table 35: Students Responses on Class Attendance Compared to Performance in 2012 Agriculture Mock Examination in Rachuonyo North District.....	66
Table 36: Family income in Rachuonyo North District.....	67
Table 37: Comparing Family’s Monthly Income and Performance in 2012 Mock Examination .	68
Table 38: Family Size of the Respondent Students	69
Table 39: Comparing Family’s Size and Performance in 2012 Mock Examination	69
Table 40: Level of Education of the Respondents’ Father	70
Table 41: Comparing Father’s Education Level and Performance in 2012 Mock Examination...	71
Table 42: Level of Education of Respondent’s Guardian.....	71
Table 43: Comparing Guardian’s Education Level and Performance in 2012 Mock Examination	72
Table 44: Level of Education of the Respondent’s Mother	73
Table 46: Analysis of Variance on Teaching and Learning Resources	74
Table 47: Regression Coefficients on Teaching and Learning Resources	74
Table 48: Regression Analysis on Teaching and Learning Resources and Performance in Agriculture Mock Examination	75
Table 49: Correlations between Teachers Experience and Performance in K.C.S.E in Agriculture 2009-2011: Mean Scores	76
Table 50: Analysis of Variance (ANOVA) on Teacher Characteristics.....	77
Table 51: Regression Coefficients on Teacher Characteristics	77

Table 52: Correlation of Age of Students and Performance in 2012 Mock Agriculture Examination in Rachuonyo North District	78
Table 53: Analysis of Variance on Students Age and Students Performance in 2012 Mock Agriculture Examination in Rachuonyo North District	79
Table 54: Regression Coefficients on Age and Students Performance in 2012 Mock Agriculture Examination in Rachuonyo North District	79
Table 55: Independent Samples T-Test Comparing the Means Score of Males and Female Students.....	80
Table 56: Correlations between Performance and Family Size.....	81
Table 57: Correlations between Level of Education of the Mother and the Performance of the Students in 2012 Agriculture Mock Examination in Rachuonyo North District.....	82
Table 58: Analysis of Variance (ANOVA) on Family Characteristics	82
Table 59: Regression Coefficients on Family Characteristics	83

LIST OF FIGURES

Figure 1: Conceptual Framework of Selected Factors Influencing Academic Performance of Students in Secondary School Agriculture.....	32
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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immuno Deficiency Syndrome
APHRC	African Population Health and Research Centre
BOG	Board of Governors
CBS	Central Bureau of Statistics
CPE	Certificate of Primary Education
DC	District Commissioner
DEO	District Education Officer
FFA	Future Farmers of America
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
IPAR	Institute of Policy Analysis and Research
KCE	Kenya Certificate of Education
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
KIE	Kenya Institute of Education
MOE	Ministry of Education
NCST	National Council of Science and Technology
OECD	Organization for Economic Co-operation and Development
PTA	Parents Teachers Association
SES	Social Economic Status
SPSS	Statistical Package for Social Sciences
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Fund for Population Activities
U/T	Untrained Teacher

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The development of any nation depends largely on the quality of education of such a nation. It is generally believed that the basis for any true development must commence with the development of human resources (Akanle, 2007). Hence, formal education has remained the vehicle for social-economic development and social mobilization in any society. Understanding different parameters that contribute directly to low performance has been a frequent topic, especially when international surveys such as the one carried out by the Organization for Economic Co-operation and Development (OECD) showed that 26% of secondary students in Spain (6% above the average of all countries surveyed) did not attain the corresponding diploma (OECD, 2001). Studies done by Fullana (1995) and Montero (1990) also sought to understand the factors that account for low performance. However, studies seeking to identify what determine academic failure frequently appeared as a reaction to conditions of change, such as plans for educational reform, or in response to critical situations as indicated by OECD study (2001) that found that 26% of Spanish students in mandatory secondary education fail to obtain the corresponding diploma.

Most programmes undertaken to improve educational efficiency in developing countries mainly focused on changing the educational system itself (Lockheed & Verspoor, 1992). Policy planners generally recommended revising the curriculum, increasing the number of schools, and distributing educational materials more widely and equitably. Zimbabwe, in particular, has given priority in the last decades to building new schools and equipping urban schools with computers. As this standard course of action is not based on empirical data, it overlooked the role of family and personal factors in shaping the academic trajectory of school children. Gender and nutritional status of the child and educational level of the parents have also been shown to influence school performance (Lockheed & Verspoor, 1992).

In another research, Akanle (2007) studied Socio-Economic Factors Influencing Students' Academic Performance in Nigeria using some explanation from a local survey. The study

revealed that insufficient parental income, family type and lack of funding by governments were factors influencing students' academic performance. The availability and use of teaching and learning materials has affected the effectiveness of a teacher's lessons. According to Broom (1973), the creative use of a variety of media increases the probability that the student would learn more, retain better what they learn and improve their performance on the skills that they are expected to develop. Ausubel (1973) also stated that young children were capable of understanding abstract ideas if they were provided with sufficient materials and concrete experiences with the phenomenon that they were to understand. Burgaleta, Valverde and Garrido (1988), found motivation to be one of the elements that most distinguishes those required to repeat a school year from those being promoted, the repeaters being those who are most bored in class (Campuzano, 2001). Other authors have found that subjects themselves attributed to low performance and low ability (Valle, 1999), and an improvement in performance to motivation (task goal orientation), to self-regulating behaviours, and to competence as a function of task characteristics (Slater, 2002).

Sanchez (2000) found that academic self-concept was at the base of future school success or failure having been found starting in Early Childhood Education from peer contact and teacher attitude and expectations. One interesting study indicated positive self-concept as one risk-reducing factor against academic failure in the case of unfavourable family situations (Fullana, 1995). In another study, self-concept was found to predict performance better than variables such as age or student gender (Edwards, 2002). The educational condition attributed to family was beyond all doubt or discussion, as there was an ever-increasing awareness of the importance of the parent's role in the progress and educational development of their children. Adell (2002) considered family background the most important and weighty factor that determined the academic performance attained by the student.

Several factors have generally been identified as causes of poor academic performance. Agyemang (1993) reported that a teacher who did not have both the academic and the professional teacher qualification would undoubtedly have a negative influence on the teaching and learning of his/her subject. However, he further stated that a teacher who was academically and professionally qualified, but works under unfavorable conditions of service would be less

dedicated to his work and thus be less productive than a teacher who is unqualified but works under favorable conditions of service. In another study, Whittington (1985) investigated the relationship between average class size and secondary school performance in Epe Local Area of Lagos state, in Nigeria, and he found significant and positive relationship between class size and students' academic performance. The smaller class size showed improved student behaviour and achievement in schools.

A study by Karemera (2003) on the effects of academic environment and background characteristics on student's satisfaction and performance, found significant correlation between satisfaction with academic environment and service received. Understanding the nature of the relationship between general cognitive ability and academic achievement had widespread implications for both practice and theory (Rhode & Thompson, 2007). Similarly, Watkins (2007) acknowledged the considerable debate regarding the casual precedence of intelligence and academic achievement and reported that students' achievement relied most strongly on their cognitive abilities through all grade levels and therefore, concluded that intelligence was related to achievement.

Rachuonyo North District is among the poorest districts in Kenya. The causes of poverty mainly include poor soils and inadequate and erratic rainfall which has led to low crop yields and thus low food intake. Table 1 shows Rachuonyo North District Poverty Levels of 72 percent.

Table 1
Poverty Levels in Rachuonyo North District

Division	% of Individuals below Poverty level	Estimated Number of Poor Individuals
East Karachuonyo	69	48,149
West Karachuonyo	74	37,668
Total	71.5	85,817

Source: Central Bureau of Statistics (1999).

The district lacks access to services like education, health, and communication, which have contributed to high incidences of poverty, either due to their inadequacy, low quality and lack of income to access those services. The high prevalence of HIV/AIDS equally has contributed to poverty, as the pandemic is killing the most economically active people, at the same time depleting the meager resources available through treatment of opportunistic diseases associated with the pandemic (Republic of Kenya, 2008). This has led to low quality education coupled with low transition to secondary schools. As a result, poor performance has increased the chances that a child lacking the skills and opportunities cannot participate fully in and contribute adequately to Kenyan society as an adult.

Agriculture as an industry has continued to remain the backbone of Kenya’s economy for a long time. This trend has justified the need to strengthen the integration of agriculture in the school curriculum in order to equip the learners with problem-solving skills for self-sufficiency (Kenya Institute of Education, 2006). This in turn has provided students taking agriculture as one of their subjects with personal, academic and career competencies essential for success in the fields of sciences, business and technology (Hedjazi & Omid, 2008). The development of Kenya’s agriculture has depended heavily on agricultural education and this in turn has created self-employment and thus makes the teaching of agriculture relevant to the majority of the rural populations by giving them information necessary for agricultural practice (KIE, 2006). Low academic performance of students in the subject was an issue in Rachuonyo North District, and therefore, there was need to understand factors influencing academic performance of these students. Tables 2 show the district mean score and mean grade in KCSE agriculture subject.

Table 2
Rachuonyo North District KCSE Agriculture Subject Performance (2007-2010)

Year	District Mean Score	Mean Grade	% Performance
2007	6.154	C	50.83
2008	6.478	C	53.33
2009	5.329	C-	44.41
2010	5.729	C	47.52

Source: DEOs Office records, Rachuonyo North (2011).

In the present study, factors such as availability of teaching and learning resources, teachers' characteristics, student characteristics and family characteristics, were studied to determine their influence on academic performance of students' in secondary school agriculture.

1.2 Statement of the Problem

The high poverty levels in Rachuonyo North District have led to lack of basic services such as education, health and communication that in turn have contributed to low quality basic education, coupled with low transition to secondary schools (Republic of Kenya, 2008). Low academic performance of students in agriculture subject in the past had been an issue in Rachuonyo North District, and therefore, the following factors were selected for study to determine their influence on students' performance in agriculture. The factors included, availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library), teachers' characteristics (age, qualification, experience, teaching methods and attitude toward teaching), students characteristics (age, student career drives, gender, study times, class attendance), as well as, family characteristics (family income, family size and family level of education). Therefore, the factors influencing academic performance of the students were to be understood, in order to seek practical ways of supporting the students to improve in their performance in agriculture subject in the Kenya Certificate of Secondary Education (KCSE).

1.3 Purpose of the Study

The purpose of this study was to determine the influence availability of teaching and learning resources, teachers' characteristics, students' characteristics and family characteristics on academic performance of students in secondary school agriculture in schools in Rachuonyo North District in order to offer recommendations for academic improvement.

1.4 Objectives of the Study

The objectives of the study were to determine:

- i. The influence of availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library) on the students' academic performance in agriculture in Rachuonyo North District.

- ii. The influence of teachers' characteristics (qualification, experience, teaching method and attitude toward teaching) on the students' academic performance in agriculture in Rachuonyo North District.
- iii. The influence of students' characteristics (student career drives, gender, study habits and class attendance) on the students' academic performance in agriculture in Rachuonyo North District.
- iv. The influence of family characteristics (family income, family size and family level of education) on the students' academic performance in agriculture in Rachuonyo North District.

1.5 Hypotheses

- Ho₁** Availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library) have no statistically significant influence on students' academic performance in agriculture.
- Ho₂** Teacher's characteristics (qualification, experience, teaching method and attitude toward teaching) have no statistically significant influence on students' academic performance in agriculture.
- Ho₃** Students' characteristics (student career drives, gender, study habits and class attendance) have no statistically significant influence on students' academic performance in agriculture.
- Ho₄** Family characteristics (family income, family size and family level of education) have no statistically significant influence on students' academic performance in agriculture.

1.6 Significance of the Study

The study findings may be useful to Universities and Colleges training agriculture teachers in making professional decisions about teacher training programmes such as strengthening the use of demonstration and field trips as teaching methods in secondary school curriculum. Policy makers and teachers in secondary schools should develop a strong inbuilt career guidance to enable students choose optional subjects that match their career objectives. The Government of Kenya should ensure that there is a good balance between experienced teachers and inexperienced teachers posted in all schools to aid students learning. The study, therefore, is of

great value to administrators, teachers and policy makers in making crucial decisions about agricultural education curriculum improvement and implementation.

1.7 Assumptions of the Study

The researcher assumed that;

- i. Students in Form One who choose agriculture as a subject eventually registered for the examination in the subject at Form Four, regardless of their gender and socio-economic backgrounds.
- ii. All the respondents involved in the study were honest in providing the required data.
- iii. The extent of syllabus coverage was more or less the same for all schools involved in the study. As a result, the KCSE achievement test scores and mean scores was a fair representation of what had been taught, therefore, success of agriculture curriculum in the respondent secondary schools.
- iv. Agriculture students were taught both theory and practical in ways that led to effective learning.
- v. The numbers of students taking agriculture in each school were uniformly distributed.

1.8 Limitations of the Study

The study did not include all the factors influencing academic performance of students in secondary school agriculture. This was due to lack of enough resources in terms of time and funds to enable the undertaking of a large scale study. The researcher did not have a direct control over other factors not selected but do affect students' performance, because their manifestations had already occurred.

1.9 Operational Definitions of Terms

This section included citable as well as operational definitions that guided the undertaking of the study.

Academic performance: Ability of a student to maintain and effectively balance the social and academic aspects of school, at the same time, one is socially proficient, goal- oriented and intrinsically motivated (Ellis & Worthington, 1994).). In this study, this term was defined as the grade a student scores in agriculture subject at KCSE examination.

Curriculum: Defined as all that is taught in a school including the timetabled subjects and all those aspects of its life that exercise an influence in the life of the children (Farrant, 1980). This study adopted the definition.

Learning: Refers to the process by which we acquire and retain attitudes, knowledge, understanding, skills and capabilities that cannot be attributed to inherited behaviour patterns or physical growth (Farrant, 1980). In this study, this term was defined as acquiring new or modifying existing knowledge, behaviuor, skills, values or preferences and may involve synthesizing different types of information.

Metacognition: Defined as the awareness and understanding one's thinking and cognitive processes; that involved active control over the process of thinking that is used in a learning situation (Flavell, 1979).). In this study, this term was defined as appreciation of what one already knows, together with a correct apprehension of the learning task and what knowledge and skills it requires, combined with the agility to make correct inferences about how to apply one's strategic knowledge to a particular situation, and to do so efficiently and reliably.

Teaching and learning resources: Defined as all the materials devised for use in teaching a particular course or subject (Farrant, 1980).). In this study, this term was defined as different types of resources, such as laboratory, classrooms, school farm, farm structures, textbooks and library used for teaching of agriculture in secondary schools.

Teacher's characteristics: Defined as teachers' personality traits, teaching skills and teaching styles (Dunkin & Biddle, 1974).). In this study, this term was defined as the qualification, experience, teaching method and attitude towards teaching agriculture in secondary schools.

Student's characteristics: Defined as students personality traits, learning styles, prior knowledge and skills as well as motivation and attitude (Dunkin & Biddle, 1974).). In this study, this term was defined as student career drives, gender, study habits and class attendance in a given school setting.

Family characteristics: Defined as family's economic status, social needs as well as the type of family relationships (Ryder, 1985).). In this study, this term was defined as family income, family size and family level of education.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review for this study was organized into four sub-headings namely: availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library), teachers' characteristics (qualification, experience, teaching method and attitude toward teaching), student characteristics (student career drives, gender, study habits, class attendance) and family characteristics (family income, family size and family level of education) on the students' academic performance in agriculture in Rachuonyo North District. The study was guided by a theoretical framework based on McClelland's Achievement Motivation Theory.

2.2 Availability of Teaching and Learning Resources and Students' Academic Performance in Agriculture

The facilities in any school have been observed as a very powerful factor to quantitative education. The importance to teaching and learning and the provision of adequate instructional facilities for education cannot be over-emphasized. The dictum that "teaching is inseparable from learning but learning is not separable from teaching" is that teachers do the teaching to make the students learn, but students can learn without the teachers. According to Akande (1985), learning can occur through one's interaction with one's environment which refers to facilities that are available to facilitate students learning outcome. These facilities include books, audio-visual, software and hardware of educational technology; so also, size of classroom, farm structures and school farms, availability of tables, chairs, chalkboards and shelves on which instruments for practical's are arranged (Farrant, 1991; Farombi, 1998).

Oni (1992) submitted that, facilities constitute a strategic factor in organizational functioning. This has been so because they determine to a very large extent, the smooth functioning of any social organization or system including education. Oni (1992) further noted that their availability, adequacy and relevance influenced efficiency and high productivity. Farombi (1998) observed that the wealth of a nation or society could determine the quality of education in that

land; emphasizing that a society that is wealthy will establish good schools with quality teachers and learning infrastructures. With such opportunities, students may learn with ease, thus bringing about good academic achievement. Writing on the role of facilities in teaching, Balogun (1982) submitted that no effective science education programme can exist without equipment for teaching. This has been because facilities enabled the learner to develop problem-solving skills and scientific attitudes. Balogun (1982) further indicated that when facilities are provided to meet relative needs of a school system, students will not only have access to the reference materials mentioned by the teacher, but individual students will also learn at their own paces. The net effect of this is increased overall academic performance of the entire students.

In a study on resource concentration, utilization and management as correlates of students learning outcomes in Oyo State, Farombi (1998) found that the classroom learning environment in some schools was poor. He cited examples of schools without chalkboard, absence of ceiling in some schools, roofing sheets were not in place, windows and doors removed among others, a situation which the researcher regarded as hazardous to healthy living of the learners.

Adesina (1981) identified poor and inadequate physical facilities, obsolete teaching techniques and overcrowded classrooms, among others, as factors why high academic attainment is not in vogue in Nigeria. Throwing more light on school facilities and moral guiding provision, Fabunmi (1997) asserted that school facilities when provided will aid the teaching learning programme and consequently improve academic achievement of students, while the models guiding their provision to schools could take any form as rational bureaucratic and or political model. Whichever model is adopted, according to him, there is always a common feature of differing allocation of facilities to schools. Ojoawo (1990), however, noted that certain schools were favoured in the allocation of facilities at the expense of others. Writing on poor performance of students in public examinations, London (1990) stated that in many developing nations certain physical facilities are none existent, and that those instances where amenities are available many are of substandard quality.

Other scholars (Wilcockson, 1994; Lawal, 1995; & Ajayi, 1996) have variously identified the significance of facilities in teaching learning spheres. They reported that absence or poor (and or

deteriorating) quality of educational facilities can affect academic performance. Gamoran (1992), however, holding a contrary view noted that facilities, teachers' salaries, books in the library and the presence of science laboratory, had little impact on variation in student achievement once student background variables had been taken into account. This statement connotes that before such student could perform well in higher educational level, he must have been groomed or cushioned by availability of resources in his elementary days upon which he now uses as a spring board. Students attitudes are shaped to some extent by the structures (facilities) through which they are mediated (Ferreira, 1995). In fact, building conditions can directly influence the attitudes of students or the attitudes of teachers and parents, which in turn affect students' attitudes. According to Proshanky (1975), physical settings simple or complex, evoke human responses in the form of feelings, attitudes, values, expectancies and desires. It is in this sense, as well as their known physical properties, that their relationships to human experience and behaviour must be understood.

Stockyard and Mayberry (1992) found that the quality of a physical environment is related to non-cognitive outcomes, such as better attitudes towards school. These outcomes may eventually relate to higher academic achievement. Christopher (1988) concluded that human nature makes people feel better about themselves when their surroundings are pleasant. Students, who have better attitudes, usually learn more and work harder. McGuffey (1972) conducted a study on pupils' attitudes toward their school classrooms in the elementary level and found that students housed in newer classrooms which were fully carpeted and air- conditioned showed more positive attitudes than students housed in older classrooms.

2.2.1 Laboratory as a Teaching Learning Resource

Laboratory is a room or a building with specific equipment specially built for teaching by demonstration of theoretical phenomenon into practical terms. Farombi (1998) agreed with the saying that "seeing is believing" as the effect of using laboratories in teaching and learning of science and other science related disciplines as students tend to understand and recall what they see than what they hear or were told. A laboratory is essential to the teaching of sciences and the success of any science course is much dependent on the laboratory provision made for it.

Affirming this, Ogunniyi (1983) said there is a general consensus among science educators that the laboratory occupies a central position in science instruction. It could be described as a place where practicals are done. To maintain and arouse the interests of students in subjects involving laboratory work, the teacher should be effectively involved in order to transfer knowledge and facts to learners for a good performance in any examinations. In line with this, one then pauses to ask, to what extent has a laboratory been able to achieve its objectives.

In another study, Odulaja and Ogunwemimo (1989) observed that the teacher assumes a position of dispenser of knowledge with the laboratory serving the function of drill or verification. They further explained that at the other extreme, the teacher assumes the position of guide to learning and laboratory as a place where knowledge is discovered. In his contribution, Balogun (1982) submitted that no effective science education programme can exist without equipment for teaching. Writing on the situation of our secondary schools today, Okoli (1995) reported that laboratories have become shelves of empty bottles of chemicals. In another study, Yadar (2007) noted that no course in science and mathematics can be considered as complete without including some practical work. The practical work ought to be carried out by individuals either in science laboratories or in classes. At school level, practical work is even more important because of the fact that we learn by doing. Scientific practices and applications are thus rendered more meaningful when laboratories are available in schools. It is an established truth that an object handled impresses itself more firmly on the mind than the object merely seen from a distance or in an illustration. Thus practical work forms an important feature in any science and mathematics course (UNESCO, 2008).

2.2.2 Classroom as a Teaching Learning Resource

Many research findings have shown that the success of any educational endeavor rests on the availability of physical facilities, especially the school building. Writing on its importance, Olutola (1982), noted that the availability of the school building contribute to good academic performance as they enhance effective teaching-learning activities. He further stated that well sited school classrooms with aesthetic conditions such as, playground, and lavatory, usually contribute to achieving higher educational attainment by the students. Williams (1973) noted that school classrooms are a very vital input to the educational system; emphasizing that even though

they do not teach but their use may facilitate or impede learning. However, Williams (1973) did not see school building as one of the critical variables affecting school academic achievement because he found no evidence to show that an expensive school building would necessarily improve academic achievement.

Giving credence to the above finding, Owoeye (1991) in his submission, expressed skepticism about any useful relationship between such expensive structures and academic achievement. Also, in his report on secondary school education in Nigeria, Adaralegbe (1983) reiterated that from Inspector's reports over the years, there is abundant evidence and catalogue of inadequacies in the provision and judicious use of school classrooms and materials for instruction. Adaralegbe (1983) further noted that many classes have been held under unhygienic conditions while some schools have no ceiling, some have no doors and windows as well as shutters and some classroom floors have not been concreted. The situation is even worst in rural areas and under these unfavourable situations; much learning cannot be expected to take place. Classrooms, offices, assembly halls, laboratories and staff quarters are needed as well as important items like furniture for staff and students, books, science equipment, games and sport equipment should be adequate in number and they should all be in good conditions for schools to function properly.

Writing on the deplorable state of public schools in Nigeria, Ogunmoyela (1994) lamented that school classrooms of public schools had no roofs, windows and doors, some walls were cracked, instructional facilities were lacking while teachers were frustrated consequent upon lack of equipment/facilities to meet educational endeavours. Comparing schools in developing countries with what is obtained in industrialized world, in terms of facilities, materials, utilization, and provision. Akintayo (1997) noted that schooling in developing countries like Nigeria takes place under condition that are very different from those in developed countries like Great Britain. Akintayo (1997) further stated that primary school pupils in developed countries are likely to go to school in modern, well-equipped classrooms and to have a curriculum that is well thought out in terms of scope and sequence.

According to Hallak (1990), facilities form one of the very powerful factors that contribute to academic achievement in the school system. They include the school classrooms,

accommodation, libraries, laboratories, furniture, recreational equipment, apparatus and other instructional materials. Hallak (1990) went further to say that their availability, relevance and adequacy contribute to academic achievement and observed that, unattractive school classrooms and overcrowded classrooms, among others contribute to poor academic attainment. Hallak (1990) noted that educational facilities should be located in appropriate places, while the needs of the users should be put into consideration. In another development, Aliyu (1993) as cited by Johnson (1998) found that there was no significant difference between students in secondary schools with and without adequate instructional facilities. However, he submitted that instructional facilities were indispensable to academic achievement of students in English Language, Mathematics, Biology and Geography while students could perform well in other subjects without adequacy of sophisticated instructional materials. He concluded that the effect of instructional facilities on students' academic achievement is more felt in pure and social sciences than in other subjects.

2.2.3 School Farm and Farm Structures as a Teaching Learning Resource

While commenting on the teaching of Agricultural Science in Nigerian secondary schools, Egun and Badmus, (2007) study revealed that the subject was taught in the classroom theoretically without practical work and the use of relevant instructional materials. As a result of the poor method of teaching, students see the subject as difficult, hence, they develop negative attitude towards it. Similarly, Egun and Badmus (2007) in their research on reducing teachers' instructional difficulties in identified content area of Agricultural Science discovered that lack of relevant instructional materials is among other reasons for teachers' difficulty in teaching certain content areas of Agricultural Science syllabus. From the findings, farm structure availability seems not to influence academic performance of students in secondary school agriculture, since performance was higher in schools without farm structures than schools with farm structures.

The implementation of 8-4-4 secondary school curriculum faced a lot of challenges and problems due to lack of facilities such as agriculture tools and machines which was cited by the evaluation report findings by KIE (1990). Rono (1990) noted that the relationship between achievement and availability of textbooks was more consistent than between achievement and other variables such as teachers' training, class size and facilities. Rono (1990) observed that

most public schools had been started without proper planning, so the majority of the schools lacked teaching facilities such as laboratories and classrooms. Lack of these resources and facilities had been aggravated by the rapid enrolment and expansion of schools together with high social demand on education (Republic of Kenya, 1999). From the various facts highlighted above, attempts were made to identify the contributions of some elements that constitute these facilities and their impact on academic achievement of students. The availability and use of teaching and learning materials affect the effectiveness of a teacher's lessons.

An influential factor on students' achievement could be the availability and the use of resources by teachers in teaching and learning activities. Simplicio (2000) suggested that teachers must be willing to utilize different methods, strategies and approaches to instruction, and they must also be willing to change their assessment tools and evaluation criteria. Availability of resources and their use by teachers in secondary schools was found to have a positive effect on students' achievement (Subedi, 2000). Armstrong, Barbrow, Brush and Ulintz (1999) also found a positive effect of resources on student's achievement when they provided teachers with a wide variety of computer - based resources to integrate with instructional activities. Alkadry and Nyhan (1999), in a research conducted in Florida, found that the more resources the students were provided with in the classroom the better they improved in their achievement.

2.2.4 Textbooks as a Teaching Learning Resource

A textbook has been considered as one of the important resource for academic achievement. Many writers (Heyneman & Loxley, 1982; Beeby, 1986) have variously highlighted the contribution of textbooks to academic achievement. Studies have revealed in some instances, that textbooks provide the only source of information for students as well as the course of study for the subject. Exploring the effects of textbooks and other factors on student achievement gain, Lockheed (1986) found in their longitudinal data from a national sample of eighth grade mathematics classrooms in Thailand that textbooks may affect achievement by substituting for additional post-secondary mathematics education of teachers and by delivering a more comprehensive curriculum. Altbach (1983) stated that "nothing has ever replaced the printed word as the key element in the educational process and, as a result, textbooks are central to schooling at all levels". In his empirical studies of use of textbooks and educational achievement

involving 1,006 primary school pupils, Fuller (1985) revealed that students who had used more than two textbooks were almost three times as likely to pass compared to students that used one textbook.

Squire (1991), writing on teachers reliance on textbooks, stated that those seeking to improve the quality of education believed that improvements in instructional materials would inevitably lead to changes in actual teaching. For many teachers, textbooks can provide an excellent and useful resource without usurping the position of the teacher. While the selection of a textbook has been adjudged to be of vital importance to academic achievement, it is sad to say that relevant textbooks are not available for teaching and learning activities (Soyibo, 1987; Odulaja & Ogunwemimo, 1989). Lack of textbooks could be identified with the high costs. When this happens, he further noted that students cannot afford to purchase. The implication therefore is that the teacher will serve as the only source of information. Where the teacher is the only source of information, his selection of a textbook may be biased in the sense that his selection may be based on reasonably unsatisfactory criteria such as its attractiveness in terms of color, print, photograph, the author's qualifications and the recognition he has accorded in some other publications. In his study on resources and resources utilization as correlates on academic achievement, Oni (1992), reported that there was a significant relationship between recommended textbooks and academic performance in introductory technology, Business Studies and Home Management, respectively.

2.2.5 Library as a Teaching Learning Resource

Library as a resource, occupies a central and primary place in any school system. It supports all functions of school-teaching and provides service and guidance to its readers. According to Fowowe (1988) a library must be up-to-date and at the same time allow access to older materials. It must be properly supported financially to fund materials and services among others. The purpose of a school library is to make available to the student's, at their easy convenience, all books, periodicals and other reproduced materials which are of interest and value to them but which are not provided as basic or supplementary textbooks.

While listing the types of libraries, Ola (1990) observed that secondary school library in whatever form, has replaced the traditional method of ‘chalk and talk’ in imparting knowledge to students that its effect on academic performance need not to be over-emphasized. Therefore, Ola (1990) concluded that a well-equipped library is a major facility which enhances good learning and achievement of high educational standard. Farombi (1998) reiterated that school libraries may not be effective if the books therein are not adequate and up-to-date as its impact may only be meaningful if the library could be opened to the students always for a considerable length of time in a school day. With all the above mentioned facts, it is sad to know that many schools operate without libraries (Shodimu, 1998) whereas Ogunseye (1986) had earlier noted that total absence of an organized school library would continue to spell dooms for thousands of secondary school students. This statement clearly implied that many schools operate without libraries and this had affected the academic performance of their students. Moreover, Fuller (1985) identified a school library as an instructional resource which may significantly influence pupils’ achievement after controlling for pupils’ family background. Thus, the effect of library size and its activity was found to be positive in 15 out of 18 analyses. Also, in another study, on the relationship between instructional facilities and academic performance, Popoola (1989) discovered that library correlates with academic achievement and those schools with well-equipped library normally maintain high academic performance. In another study on raising school quality in developing countries, Fuller (1985) found that collection of books kept for reading in the library is related to performance.

2.3 Teachers’ Characteristics and Students’ Academic Performance in Agriculture

There has been a substantial theoretical and practical shift of emphasis, mostly in mainstream education towards acknowledging that teachers are among the principal components of any pedagogical programme (Goldhaber, 2002). This is because teachers influence students’ achievement by holding the key to sealing gaps in student’s achievement outcomes (Sanders, 2000). Teaching style has been found to be a very influential factor in students learning experiences (Knowles, 1980). As a critical component in determining the extent of student’s learning, teachers provide the vital human connection between the content, the environment and the learners (Heimlich & Norland, 1994). This is because the teaching style stems from an additional philosophy that lends direction and purpose to a teacher’s teaching (Galbraith, 1999).

Findings of a study done by KIE (2010) found that although most of the teachers have basic qualifications to teach in secondary schools, they do not have the right competencies to tackle the new revised agriculture syllabus introduced in 2002. This has been worsened by the fact that schools suffer serious teacher shortages and inadequate teaching learning materials, Aduda (2010).

Students are taught in a variety of ways in schools where teachers use different materials within classrooms having unequal sizes. The average student classroom achievement, to some extent, may depend on the teacher's specific style of instruction. This teacher's performance may be shaped by the extent of use of creative teaching materials, quality of such materials, effective teaching techniques employed by the teachers, resources available for them and use of such resources during the teaching and learning process. A study done by Wenglinsky (2000) observed that teacher inputs influence teacher's professional development. The latter in turn influences classroom practices which influence student achievement, and all these influences take into account socio economic status and class size, suggesting that the impact of teacher quality is measured above and beyond these non-teacher quality factors (Wenglinsky, 2000).

Research on effective teaching has generated sufficient evidence to show that attitudinal attributes and teaching behaviours are consistently associated with effective teachers. Teachers' behaviours, particularly those concerned with classroom instructional practices such as characteristics of good teaching, where the teacher structures his teaching in relation to his pupils, the curriculum, resources as well as teaching methods have been extensively reviewed by Brophy and Good (1986). Twoli (1986) on his study on sex difference in science achievement among secondary students in Kenya strongly supported the notion that trained teachers do make a difference for more advanced grades, especially for more difficult subjects like sciences.

According to the Kenya Institute of Education Report (1990), majority of the graduate teachers had adequate knowledge of the new content areas. The report further indicated that most of the untrained teachers seemed to lack competencies in Form Three and Four syllabus content areas. The report also indicated that most of the teachers in private schools were untrained and therefore, incapable of interpreting the curriculum adequately. Irumbi (1990) also found that

pupils' performance in mathematics examinations was significantly affected by teachers' professional and academic qualifications. A study by Kathuri (1986) found that teacher's academic qualifications had a significant contribution to performance of students in agriculture in secondary schools. Similarly, a research done in the teaching of agriculture by Kibett and Kathuri (2005) observed that students who were taught using project based learning outperformed their counterparts taught using regular teaching approach.

Husen, Saha and Noonan (1978) found that student achievements was a good measure of teachers' effectiveness, in which teaching effectiveness was positively related to experience and professional training. Experience enables teachers to be more competent in the mastery of the subject content and delivery. This helps the teacher to positively identify areas of difficulty in the content and adjust appropriately, consequently contributing to improved academic success in secondary agriculture. In another study, Neagley and Evans (1970) observed that effective supervision of instruction can improve the quality of teaching and learning in the classroom. Etsey, Amedahe and Edjah (2004) in a study of 60 schools from peri-urban (29 schools) and rural (31 schools) areas in Ghana found that academic performance was better in private schools than public schools because of more effective supervision of work.

Teachers are the main facilitators of learning in schools and as such, they have a strong influence on student learning. The dictum, teachers do make a difference (Centra & Potter, 1980), is gaining popular support, as is evident in research literature. For example, Pollard (1990), in explaining the role of teachers, stated that very little of quality can happen in schools without skilled, knowledgeable and committed teachers. Other studies also affirm that teachers do make a difference in students learning (Good, Grouws & Ebmeier, 1986). Moreover, teachers do matter in students' education because they have a strong influence on student learning (Harris, Rosenthal & Snodgrass, 1986). Imperatively, understanding how teachers contribute to student achievement is a key to improving and attaining educational effectiveness. Teacher's sense of efficacy, that is their belief in their ability to have a positive effect on student teaching (Ashton, 1995), is another teacher characteristic consistently related to student achievement. Teachers' effectiveness encompasses not only skills in teaching practices and competencies in management

and organization but also interests, beliefs and attitudes, which teachers bring to their classrooms.

Although there is little, if any, empirical research investigating the link between teacher's reflectivity and student achievement, Akbari (2007) and Laboskey (1994), explored, mostly at the theoretical level, the benefits of reflective practices for teachers' effectiveness. The construct is widely recognized as one of the most important schooling factors influencing student achievement gains (Ferguson, 1998; Goldhaber, 2002; Sanders, 2000). These studies suggest that reflective practices help to free teachers from both impulsive and routine behaviour. Reflection, in addition, provides the means for teachers to build their daily experiences, allows them to act in a deliberate critical and intentional manner, raises their awareness about teaching, enables deeper understanding, and triggers positive change (Farrell, 2003). By engaging in reflection, teachers become better observers of classroom behaviour, which stimulates an awareness of their teaching decisions and the reasons behind those decisions. As they begin to understand the motivation for their more intuitive decisions, their practices become increasingly explicit (Nolan & Huebner, 1989). In turn, this understanding informs teachers' classroom approach and reduces their cognitive dissonance, making them less inclined to rely on traditional practices, if those practices do not produce the desired educational results (Garman & Gaynor, 1986).

Freedom from conventional practices leads to the replacement of unsubstantiated opinions with grounded belief (Laboskey, 1994) and makes teachers be not only consumers of knowledge, but also primary producers of new knowledge. Finally, this leads to advances in teacher intellectualism, practice, self-management, an increase in practitioners' ability to remain current in their field, and a constructivist paradigm of life-long learning (Nolan & Huebner, 1989). Reflectivity, besides its impacts on practitioners themselves, is thought to have some effects on student learning. It is argued that a teacher's engagement in reflective teaching promotes students' ability to be critically reflective, an issue which has been at the heart of recent calls for education reforms (Yost, Sentner, & Frolenza-Baily, 2000). As teachers become more aware of reflective practices, they begin to model reflective behaviour for their students (Nolan & Huebner, 1989). In a study of Telesecundaria students, Husen et al. (1978) observed that teachers' attitude towards their jobs is unrelated to achievement. However, Mwangi (1986) found

that teachers' negative attitude was being reflected in the students' poor performance in Mathematics. In another study, Twoli (1986) in a study of sex differences in science achievement among secondary school students in Kenya, observed that teacher's behaviour and attitude were important variables, which accounted for student achievement. Teacher's attitudes towards their work and their interaction with pupils, has a great impact on academic achievement and retention of students, particularly girls (Abagi, 1997). Some teachers regarded their task as merely transmitting knowledge rather than guiding pupils through learning process (UNESCO, 1998). Such attitudes among teachers are intensified by poor working conditions, and lack of professionalism. As a result, Abagi (1997) contends that students are neglected, abused, mishandled and often sent out of class during teaching and learning periods. This attitude makes students hate school, leading to absenteeism and subsequent poor performance in agriculture, as well as other subjects. In an attempt to achieve the objectives of secondary school education and improve performance, researchers have examined various strategies of teaching in other subjects. For example, Wachanga and Mwangi (2004) found out that the teaching method of cooperative class experiment improved students' understanding of the chemistry subject. This method also increased student motivation to learn.

2.4 Students' Characteristics and Academic Performance in Agriculture

Many researchers recognized that class attendance is an important aspect in improving student's performance. Several studies (for example, Collett; 2007 & Chow, 2003), have found that attendance has small, but statistically significant, effect on student performance. Marburger (2001) concluded that students who were absent on a given date were significantly more likely to respond incorrectly to questions relating to material covered that day than present students. Similarly, Moore (2006) on his study on how student's attitudes about class attendance relate to their performance in introductory science classes indicated that class attendance enhances learning, on average; students who attended most classes made the highest grades, despite the fact that they received no points for coming to class. In another study, Arulampalam (2007) found that there is a causal effect between student absence and performance with missing class leading to poorer performance. On the other hand, Martins and Walker (2006) found no significant effects from class attendance. This was also supported by Park and Kerr (1990) and Schmidt (1993) who found an inverse relationship between student's attendance and their course

grades. The level of career aspiration usually affects curriculum choice hence career choice (Herr & Cramer, 1996). Also, career aspirations are influenced by numerous factors including gender, race, parental support, academic achievement, socioeconomic status, and self-esteem. Similarly, several factors which have been found to be theoretically and empirically related to career aspirations also influence the career choice process. Some of these factors include gender (Jones & Larke, 2001), parents' occupation (Stone & Wang, 1990), and parents' level of education (Jones & Larke, 2003). Darling (2005) conducted a longitudinal study concerning extracurricular activities and the results showed that the students who participated in school-based extracurricular activities had higher grades, higher academic aspirations, and better academic attitudes. Organized sports also provide an opportunity for initiative, emotional regulation, goal setting, persistence, problem solving and time management (Larson, Hansen, & Moneta. 2006), which may help to explain association found between sports participation and academic achievement (Marsh & Kleitman, 2002).

Various studies have been done and results have indicated that peer influence have impact on student performance (Hanushek et al., 2002; Geothals, 2001; & Gonzales et al., 1996). The peer influence has more powerful effects than the influence of immediate family. Peer support was positively related to student's cumulative grade point average. Wilkinson (2002) concluded that, by grouping students in heterogeneous learning ability (low ability students grouped with high ability students) will show an improvement in learning process and outcomes. Top students can positively affect less able students. Schindler (2003) found that mixing abilities will affect weak students positively. However, the effect for good students was negative. This contradicts with Geothals (2001) who found that students in homogenous groups (regardless of high ability or low ability) perform better than students in heterogeneous group. Previous researches (Brozozowki; 1988 & Johnson, 1991) have indicated that several student characteristics are associated with achievement in agricultural mechanics. These characteristics included gender, grades in agricultural courses and farm work experience.

In another study, Dlamini (1995) revealed that out of the eleven predictor variables from home and school variables, only two students' overall grade and science grade were significant on agriculture students' achievement. The rest of the home variables indicated negligible low

association with performance of secondary school students in agriculture. A study conducted by Bank (1991), revealed that boys were more active, independent and assertive than girls, and therefore, he concluded that boys generally achieved higher average scores than girls in mathematics and sciences. United Nations Fund for Population Activities (UNFPA,1991), in a booklet entitled “Women in Higher Education and Professional Trainings in Kenya,” the percentage of students performance in KCSE and KCE varied according to gender with male students performing better than female students in science and science related subjects.

Despite the favourable physical and human resources provided, learning is ultimately much dependent upon the students themselves. Student characteristics, for example, meta-cognition or self-regulation of one’s learning, perseverance on learning tasks and motivation for continual learning have long been recognized as critical determinants of learning outcomes (Wang & Walberg, 1991). Similarly, Good and Brophy (1994) identified students’ motivation, that is, their willingness to engage in activities and their reasons for doing so, as the single most important factor influencing student learning. They drew an analogy between motivation and learning with the expression “You can lead a horse to water, but you can’t make it drink”. Students will learn when they engage in academic activities which they find meaningful and worthwhile.

Several studies have concluded that students’ academic achievement is significantly related to their adaptive functioning, that is, their communication, socialization and daily living skills (Brady, Tucker, & Harris, 1992). Students’ ability to communicate in the classroom is essential to success in school. Tuttle, Becker and Sousa’s (1988) research revealed that characteristics of successful students include the ability to communicate with clarity, to relate well to peers and figures of authority and to work independently. Students who are weak in language also suffer from reading and writing disabilities- limitations that have serious implications for their academic progress. In mathematics for example, Lopez, Veloo and Maawiah (1992) concluded in their report that a major factor affecting pupils understanding of mathematics concepts and which contributes to poor performance in mathematics in Brunei Darussalam, is their poor command of English language. Similarly, they found that students’ performance in the Certificate of Primary Education examinations was attributed to students’ weak command of the

English language, hence, the major cause of their poor performance since many had difficulties in solving word problems in mathematics.

In a study, on the relationship between student's metacognition and academic performance, Romainville (1994), found that high achieving students seem to use metacognitive knowledge. In addition, high achieving students tend to be often more conscious of cognitive rules than do low achieving students. In another study by Al-Hilawani and Sartawi (1997), it was also found that good study skills and habits are fundamental for student's academic performance. Teacher-pupil relations are also mediated by the teacher's attribution of poor performance to the student (Georgiou, 2002). Peer influence on the child's development occurs by similar mechanisms as those used by adults, such as reinforcement, modeling and direct teaching and skills. Interaction with peers also promotes acquisition of social competencies such as controlling aggressive impulses and the expression of pro-social behaviours. In relation to academic performance, the socio-metric status of the student influences performance both directly and indirectly, since it is influenced by intelligence (Castejon & Perez, 1998). Similarly, in another study, (Buote, 2001), found that positive correlations exist between performance and peer relationships, and this was demonstrated in another study that students failing in school are those most rejected by their peer groups (Montero, 1990).

School variables, which principally include the students and his peers and the teachers, influence performance of students. Marchesi and Martin (2002) proposed that the pupil's sociocultural level and his previous aptitudes indirectly influence the results of learning since they delimit classroom procedures. As for characteristics of the teacher- pupil relationship, this relationship is considered a key element for the pupil's personal and academic development, the value given from teacher to pupil and vice-versa is usually reciprocal, highlighting additionally the personal relationship (Marchesi & Martin, 2002). Other studies found positive relationships between the teacher's motivation and that of the student (Atkinson, 2000).

Several studies (for example, Spatz, 2002; Hedjazi, 2002; Dlamini, 1995), have been undertaken which focused exclusively on academic achievement in relation to other cognitive, social and personal factors to predict students' academic performance. Kennedy and Tay (1994), in their

survey on the factors affecting student performance in economics, found student's study effort, age, and a good match between the students' learning style and teacher's teaching style, all had positive effect on his or her academic performance. Similarly, Cohn, Cohn and Bradley (1995) found that memory and note taking affected learning in the introductory courses in economics, while Lane and Porch (2002), in their study on factors affecting student performance in an introductory undergraduate financial accounting course, found that age and attitude towards the course had significant effects on student's performance. The implications of the relationships for education are apparent since achievement in skills, concepts and content are the acknowledged goals of the educational process (Palaniappan, 2005).

2.5 Family Characteristics and Students' Academic Performance in Agriculture

The influence of family educational climate is defined by the amount and the style of help that children receive from the family. This is determined by elements of the family context, like the dynamics of communication and affective relationships, attitudes towards values and expectations. Along the same lines, Marchesi and Martin (2002) found that parental expectations have a notable influence on academic results, even when controlling for initial knowledge and socio-economic context. Similarly, Jing-Lin (2009) studied the determinants of international students' academic performance comparing between Chinese and other international students using a multiple regression analysis. The results found that the perceived importance of learning success to family, English writing ability and social communication with their compatriots are significant predictors for all international students. As the predominant group, Chinese students display some distinctive characteristics. A less active learning strategy was observed among Chinese students relative to others, but no evidence was found that this negatively affects their academic achievement.

In another study, Castejon and Perez (1998) found indirect relationships with performance from the student's perception of how much importance his or her parents assign to study at home. Other studies show that the level of family cohesion (Caplan, 2002) and family relationships (Buote, 2001) prove themselves capable of predicting performance. The parenting style (such as democratic, authoritarian) is also influential both in the student's educational process as well as in family-school relations. Caplan (2002), in another study found that homework assignment

given by teachers in class to be a correlate of academic performance. He stated that homework bore a positive relationship with learning outcomes when it is relevant to learning objectives, assigned regularly in reasonable amounts, well explained, motivational and collected and reviewed during class time and used as an occasion for feedback to students.

Parental involvement has been a critical factor in successful academic programmes. It is widely acknowledged that the influence of parents on their children's learning is even greater than that of schools. Personal attention from parents is the single most effective reward for students' accomplishments. In a study, Motsinger (1993) found that high achievers received personal attention frequently from their parents and they also shared more time together at home. Parental involvement has a direct, positive effect on achievement grades and it also leads to increased time spent on homework, which in turn has a positive effect on achievement grades (Fehrmann, Keith & Reimers, 1987). Parental involvement in school is another important factor which influences students' achievement. Motsinger (1993) found that the higher achievers had parents who were actively involved in community volunteer groups such as local school boards, Parent-Teacher Associations, neighbourhood associations, and Boy and Girl Scouts.

Home background related variables such as educational level of father, mother, family income, and access to land by a family, influences academic performance of students in secondary agriculture. Jeynes (2002b) identified the effects of various influences on children's emotional and educational well-being, including divorce and remarriage, single parenthood, non-traditional family structures, race, socio-economic status and mobility.

A study by African Population Health and Research Centre, Aduda (2010) observed that performance of pupils in reading and mathematics is largely influenced by the socio-economic background of their parents, where they live, and whether or not they aspire to go to University. Spatz (2004) examined psychological predictors of academic achievement for students enrolled in self-placed mathematics courses. The study found out that those students with high level of achievement motivation, low mathematics anxiety and procrastination scores, were most likely to complete the class with a passing grade.

Johnson (1991) indicated that average grade in agriculture courses, and farm work experiences were all positively related to achievement in the agricultural mechanics contest. In another study, Randl, Arrington, and Cheek (1993) concluded that, among the variables, student interest in agriculture, grade point average, Future Farmers of America (FFA) involvement, and socio-economic status, only grade point average was positively related to student achievement in practical skills in agricultural sciences.

In most African Countries and the Western World, socio-economic status of a family is usually linked with the family's income, parents' educational level, parents' occupation and social status among the kith's and kin and even at the global level. Ford and Harris (1997) followed this logic while examining parental influences on African American students' school achievement by focusing on specific socio-demographic factors, including parents' level of education, marital status, and family income. It is generally believed that children from high and middle socio-economic status parents are better exposed to a learning environment at home because of provision and availability of extra learning facilities.

Drummond & Stipek (2004) while discussing their "Low-income Parents' beliefs about their role in children's academic learning" mentioned that a few of these parents indicated that their responsibilities were limited to meeting children's basic and social emotional needs, such as providing clothing, emotional support, and socializing manners. So these parents' shortsightedness toward their responsibilities in the educational processes of their children and scarcity of fund to intensify such processes could be a challenge to their children's success. But does the affirmed impact of low socio-economic status of the parents really account for students' low academic performance? In and of themselves such socio-demographic variables do not fully account for the academic successes or failure of minority students (Smith, Schneider, & Ruck, 2005). But previous studies in the same field have established that other factors in spite of SES can boost academic successes among students. Studies which examined African American parents recorded that parents who maintained positive views about the value of education and who hold high academic expectations have children who often experience higher levels of academic achievement (Ford and Harris, 1997).

A study by African Population Health and Research Centre, Aduda (2010) that sampled 7,475 pupils in schools in Harambee, Jericho, Korogocho and Viwandani, in Nairobi found that home location, family size and income as well as family head's level of education and gender, influence performance of pupils. These factors were found to have a great impact on schooling decisions parents made for their children. In large families the researchers observed that children tended to start school late or not at all. This, according to the study, is because the bigger the family, the smaller the resources allocated to different needs including education. In another study, entitled "Do Household Characteristics matter in Schooling Decisions", Oriedo, (2010) the writer discusses on how learning opportunities increase for children in homes with responsible adults. In such homes, school children get moral support, help with school-work and learning resources, which boost their morale and interest in education, hence, perform better than their counterparts who have no role models. The study further observed that parent's level of education and gender of the family head, had a direct impact on schooling decisions. In households where the head had post-secondary education, parents gave education a priority compared to parents with low level of education.

An investigation conducted by Agus and Makhbul (2002) indicated that students from families of higher income levels perform better in their academic assessment as compared to those who come from families of lower income brackets. Checchi (2000) also concluded that family income provides an incentive for better student performance; richer parents internalize this effect by investing more resources in the education of their children. Once the investment is undertaken, the student fulfills parent's expectations by performing better in their studies. In the same study Checchi (2000) demonstrated that children from richer families perform better than those from poorer families. On the other hand, Hijazi and Naqvi (2006) found that there is a negative relationship between student performance and student family income. Research done by Beblo and Lauer (2004), also found that parent's income and their labour market status have a weak impact on children's education.

According to Ermisch and Francesconi (2001), there was significant gradient between each parent's educational level and their child's educational attainment. Relative to a parent with no qualifications, mother's education has a stronger association with her child's educational

attainments than the education of the father. This result was supported by Agus and Makhbul (2002). They indicated that the level of education of the mother has been found to exert the strongest influence on academic achievement as compared to level of education of the father. Among family factors of greatest influence are social class variables and the educational and family environment. With regard to social class, Marchesi and Martin (2002) found that one's results and expectations for the future are better the higher one belongs on the social ladder, and therefore, concluded that upper-class students show a better use of metacognitive strategies than those of a lower social class. The influence of social class is mediated by cultural level, which in turn determines family expectations, values and attitudes regarding education. In other words, motivation to achieve depends on the parent's level of learning than on their level of income (Llorente, 1990).

2.6 Theoretical Framework

The theoretical framework for this study was rooted in McClelland's Achievement Motivation Theory. "Achievement Motivation Theory attempts to explain and predict behavior and performance based on a person's need for achievement, power, and affiliation" (Lussier & Achua, 2007). The Achievement Motivation Theory evolved from work McClelland began in the 1940s. In 1958 McClelland et al described human motives in the *Methods of Measuring Human Motivation* and he identified human motives related to the achievement motive, the affiliation motive, the sexual motive, and the power motive. In his later work, *The Achieving Society* McClelland, (1961), however, focused his attention on only need for Achievement, the need for Affiliation, and the need for Power. In essence, McClelland's theory postulates that people are motivated in varying degrees by their need for Achievement need for Power, and need for Affiliation and that these needs are acquired, or learned, during an individual's lifetime (Daft, 2008; Lussier & Achua, 2007). In other words, most people possess and will exhibit a combination of three needs.

McClelland, Atkinson, Clark, and Lowell (1958) defined the need for Achievement as "success in competition with some standard of excellence. That is, the goal of some individual in the story is to be successful in terms of competition with some standard of excellence. The individual may fail to achieve this goal, but the concern over competition with a standard of excellence still

enables one to identify the goal sought as an achievement goal. McClelland et al. (1958) went on to describe that competition with a standard of excellence was most notable when an individual was in direct competition with someone else but that it can also be evident in the concern for how well one individual performs a task, regardless of how someone else is doing. According to Lussier and Achua (2007), “the need for achievement is the unconscious concern for excellence in accomplishments through individual efforts”. Similarly, Daft (2008) stated that the need for Achievement is “the desire to accomplish something difficult, attain a high standard of success, and master complex tasks. Individuals who exhibit the need for Achievement seek to accomplish realistic but challenging goals. This theory is appropriate for my study because the students’ will try to achieve the need for achievement through high academic performance, since the need for achievement is the unconscious concern for excellence in accomplishments through individual efforts. Therefore, factors which influence students’ motivation for achievement need to be studied in order to understand those factors and their influence on academic performance of students in secondary school agriculture in Rachuonyo North District.

2.7 Conceptual Framework

In Rachuonyo North District, students come from different educational and family backgrounds as well as different personal characteristics. Agriculture students have their required laboratory classes on farms, in green houses, on dairy farms and in villages. Each of these could, in a way, have its effect on a student academic performance. The framework is represented diagrammatically in Figure 1 that shows the relationship of variables for determining influence of selected factors on the academic performance of students in secondary school agriculture in Rachuonyo North District. Learning outcomes are influenced by various factors which constitute independent variables. The variables considered are availability of teaching and learning resources, teacher’s characteristics, student’s characteristics and family characteristics. Principal’s training and the type of school are intervening variables which was controlled. Training determines the management styles a principal uses and how effective the principal will use the style. The type of school as a teaching environment affects the learning outcomes. The type of school that was used was co-educational to control the effect of the classroom environment, where Form Four agriculture students were involved in the study, because they have stayed in the longer compared to other students.

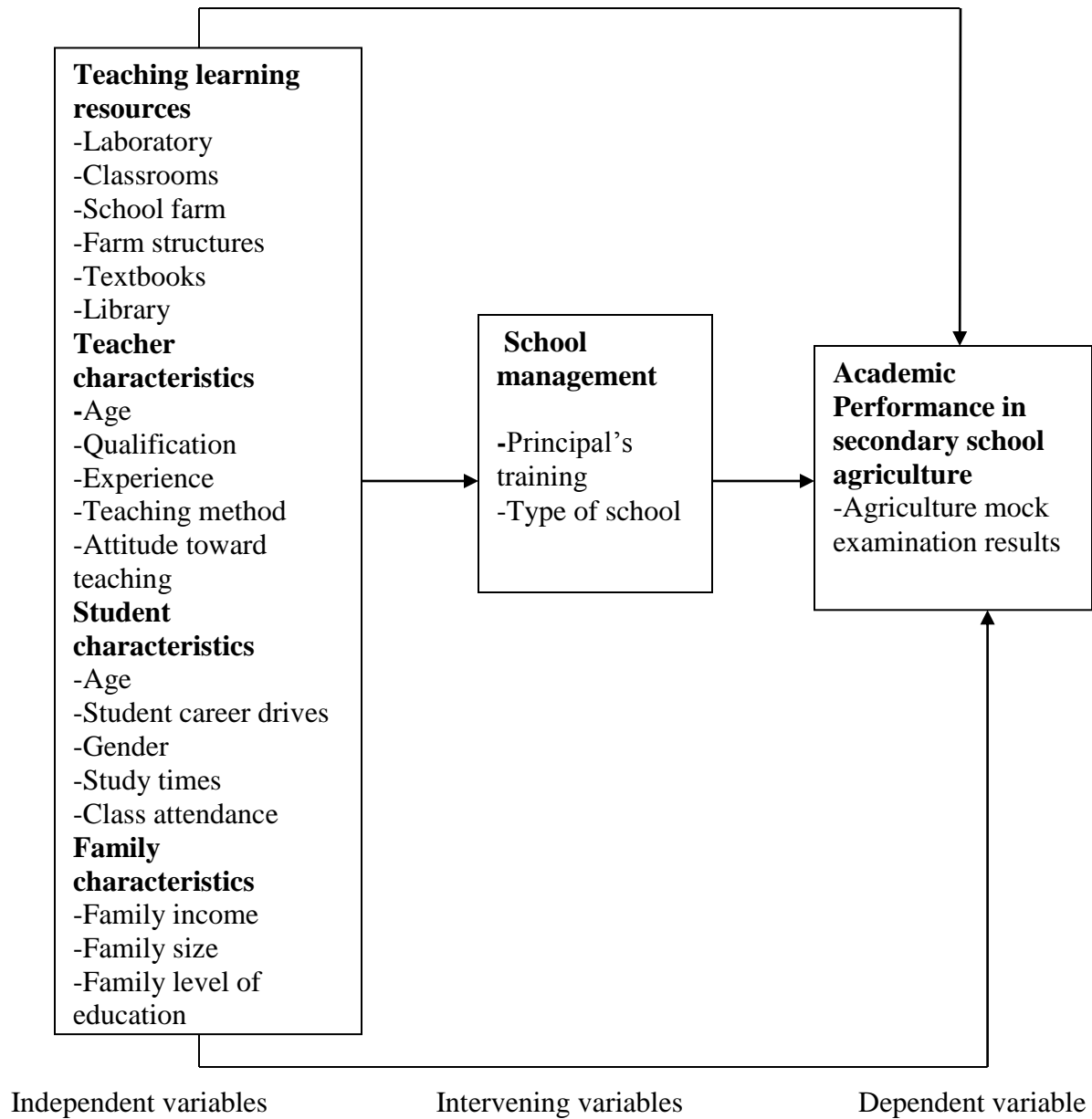


Figure 1: Conceptual Framework of selected factors influencing Academic Performance of Students in Secondary School Agriculture

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes research design and presents the study population, sampling procedure and sample size, instrumentation, data collection procedure and data analysis.

3.2 Research Design

The study used co-relational design to get opinions of students on the home and school related variables, as well as to determine the degree of association between performance in agriculture by secondary school students and the school related variables. In this case, the influence of the independent variables on the dependent variable shall have taken place without the researchers' manipulation. Co-relational study involves collection of two or more sets of data from a group of subjects in order to determine the subsequent relationship between the two sets of data (Kathuri & Pals, 1993). The research design was best for the study because the purpose was to identify whether there is any relationship between selected factors and academic performance in secondary school agriculture.

3.3 Location of the Study

Rachuonyo North District is located in western part of Kenya in Homabay County along the shores of Lake Victoria. The district is approximately 90 kilometers to Kisumu City and about 500 kilometers to Nairobi City. The district has an area of 438.2 sq. km². Administratively, the district has two divisions, namely East Karachuonyo and West Karachuonyo divisions. These divisions are further divided into 22 locations which together constitute Karachuonyo Constituency.

3.4 Population of the Study

The target population consisted of agriculture teachers and Form Four students who had opted to take agriculture as one of their KCSE optional subjects in secondary schools in Rachuonyo North

District. It was assumed that the performance of the 2012 Form Fours in KCSE will be more or less the same as the performance of the previous Form Four candidates as shown on Table 2. However, the results were to be generalized to the whole district population of 9059 students from form One to Form Four in Rachuonyo North District.

Rachuonyo North District has 38 secondary schools with a total population of 9,059 students. Consequently, there are 38 agriculture teachers. Form Fours registered for 2012 KCSE agriculture subject were selected to participate in the study out of a population of 9,059 students as shown in Table 3. Rachuonyo North District was appropriate for the study because it had a critical mass of 30 cases for the study in terms of the number of teachers, and students as suggested by Borg and Gall (1993).

Table 3
Number of Schools per Division and Student’s Enrollment

Name of Division	Number of Schools	Number of Students	Agriculture Teachers
East Karachuonyo	24	4,917	24
West Karachuonyo	14	4,142	14
Total	38	9,059	38

Source: D.E.O’s office records, Rachuonyo North (2012).

3.5 Sampling Procedures and Sample Size

Stratified sampling was used to select schools for the study. Geographical location was used as the criteria for stratification. Mugenda and Mugenda (2003) noted that the goal of the stratified random sampling is to achieve the desired representation from various sub groups in the population. In determination of sample size, Krejcie and Morgan (1970) have provided the following formula for estimating the sample size (S) needed, relative to population of known size (N) and a specified confidence level associated with a chi square statistic for one degree of

freedom, and the designated degree of accuracy as reflected by the amount of the sampling error (d) that can be tolerated.

The formula is as follows:

$$S = \frac{X^2 NP(1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

Where S= required sample size

N= the given population size

P= population proportion that for the table construction has been assumed to be .50, as this magnitude yields maximum possible sample size required.

d= the degree of accuracy as reflected by the amount of error that can be tolerated in the fluctuation of a sample proportion p about the proportion.

P= the value of d being .05 in the calculations for the entries in the table, a quantity equal to plus or minus 1.96 ó p.

X²= table value for chi square for one degree of freedom relative to the confidence.

From the table, a finite population of 750 cases will have an equivalent sample size of 254 cases Krejcie and Morgan (1970). Rachuonyo North District had 754 student's population registered for agriculture in 2012 meaning that the sample size required will be 254 students.

The required critical mass was 30 secondary schools which offer agriculture as a subject. This is because Borg and Gall (1993) suggested a minimum of 30 cases for co- relational research. A total of 254 Form Four students in the district were involved in the study. These 254 students were divided by 30 schools participating in the study to give about 9 Form Four students per school assuming that the number of form fours are equally distributed in the schools as indicated in Table 3, that were randomly selected and consequently, involved in the study because they were able to provide relevant information about, availability of teaching and learning resources, teachers characteristics, student characteristics and family characteristics variables because they had been in the school for a considerable time, thus, are able to give reliable information asked in the questionnaire. Finally 30 agriculture teachers gave vital information concerning performance variables related to agriculture as a subject in the school, hence, academic performance of students in secondary school agriculture in Rachuonyo North District.

In stratified sampling, subjects are selected in such a way that the existing sub groups in the population are produced in the sample. It was therefore, in order to have appropriate representation of each of the two divisions in the district. To come up with appropriate divisional representation, this simple formula was used as follows:

$$Z = \frac{S_n \times n}{\sum S_n}$$

Where Z= Divisional representation

S_n = Total number of schools in the division

n = Sample size required

$\sum S_n$ = Total number of schools in the district.

East Karachuonyo division $24 \times 30 / 38 = 19$

West Karachuonyo division $14 \times 30 / 38 = 11$

Total number of schools selected $= 30$

Selection of specific schools from each division was done through stratified random sampling. For this purpose, all schools from each division were assigned numbers written on a piece of paper and neatly folded. The folded papers were put in a container and thoroughly mixed. Then, the required number of schools was picked randomly, one by one from the container, until the required sample size was obtained. The selected schools participated in the study. This was done to give all the schools in the district equal chances to participate in the study.

The unit of sampling was secondary school rather than individual learners because secondary schools operate as an intact group (Borg & Gall, 1989). This means, therefore, that each school was considered as one group. The number of participating students was determined through stratified sampling method but using, an intact class for each stratum. The actual strata from which the sampling was done were two hundred and fifty four agriculture students. The sample frame consisted of 254 secondary school agriculture students who had intact academic record in the year 2012. The number of participating students (254) was determined through stratified sampling method using an intact class for each stratum as shown in the Table 4.

Table 4**Number of Schools per Division and Enrollment in Agriculture**

Name of Division	Number of Schools	Number of Students	Sample Schools	Students selected	Agriculture Teachers selected
East Karachuonyo	24	403	19	161	19
West Karachuonyo	14	351	11	93	11
Total	38	754	30	254	30

Source: D.E.O's office records, Rachuonyo North (2012).

3.6 Instrumentation

The researcher carefully designed measurement instruments because constructs in educational research like achievement, attitude, motivation, creativity and aptitude cannot be directly measured but can be inferred from representative measurement (Kathuri & Pals, 1993). Data on the dependent variable (students' academic performance in agriculture) was the scores on the agriculture mock examination taken by all agriculture students during the year 2012. A researcher – developed questionnaire personally administered on the spot was used to collect data on the availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library), teachers' characteristics (age, qualification, experience, teaching method and attitude toward teaching), student characteristics (age, student career drives, gender, study habits, class attendance) and family characteristics (family income, family size and family level of education).

Data for this study were collected using two sets of questionnaires, namely, for agriculture students and agriculture teachers. The questionnaire for students had two parts. Part A consisted of items aimed at obtaining general information about the respondent and the school. Part B consisted of specific items related to the objectives of the study.

Questionnaire for agriculture teachers also had two parts. Part A consisted of items aimed at obtaining general information about the teacher and the school, while part B consisted of items related to the objectives of the study, which was used to make conclusions on academic performance of students in secondary school agriculture.

3.6.1 Validity

Validity of an instrument represents the extent to which the instrument measures what it purports to measure (Tuckman, 1978). To enhance validity, a pilot study was carried out. The purpose of the pilot study was to ensure that the items in the instrument are stated clearly and have the same meaning to all the respondents. It is during pilot testing that the researcher established the ease of use of the instrument, and more so, time taken to administer the instrument. Information obtained during pilot study was used to revise the instrument. Mugenda and Mugenda (2003) noted that 10% of the sample size is recommended for pilot study. Therefore, 25 students and 3 teachers from schools in Ndhiwa District were involved during pilot study. The instrument was also validated by my supervisors. The respondents that were used for pre-testing were excluded during the final administration of the instrument. This helped to control extraneous influence on the research findings due to their prior knowledge of the information required by the instrument.

3.6.2 Reliability

Reliability of a test is usually expressed as a correlation coefficient that measures the strength of association between variables. Reliability coefficient shows the extent to which an instrument is free of error that may arise from inaccurate coding, ambiguous instructions, interviewer's fatigue, and bias (Mugenda & Mugenda, 2003). The research process attempted to minimize random error and hence, increased the reliability of data collected. Reliability was evaluated by calculating a reliability coefficient using split-half method to establish the reliability or internal consistency of the instrument. Split half method is easy to perform, and its time and cost effective method. A test was administered to the group and the scored items were divided into two parts, that is, odd numbered items together and all the even –numbered items together. Each subject's total score from the two groups were computed and all the scores correlated. A correction factor was applied on the computed coefficient because only the half of the test scores

were correlated with the other half. The adjusted coefficient will represent the reliability of the whole test. The correction was done using the Cronbach's Coefficient Alpha. Two questionnaires were used to collect data for the study. Cronbach's alpha value of 0.72 was obtained from the two questionnaires used for the study.

$$P_{xx} = \frac{2P_{yy'}}{1+P_{yy'}}$$

Where; Instrument contains 2 equal halves

P_{xx} = Reliability coefficient of the whole test

P_{yy} = Correlation coefficient between the two halves

A reliability coefficient of 0.72 calculated implied that the instruments used had a high degree of reliability.

3.7 Data Collection Procedure

A research permit was obtained from the National Council of Science and Technology (NCST) through the MOE. A letter from Rachuonyo North District Commissioner and Rachuonyo North District Education Officer were obtained in order to grant the researcher authority to carry out the study in Rachuonyo North District. The researcher visited the sampled schools to administer the questionnaire to Form Four agriculture students and agriculture teachers in all the sampled schools with permission from sampled school's principals, while collecting data on teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library), teachers 'characteristics (age, qualification, experience, teaching method and attitude toward teaching), students characteristics (age, student career drives, gender, study habits, class attendance), as well as, family characteristics (family income, family size and family level of education). Questionnaires were administered to 30 secondary agriculture teachers, as well as, 254 agriculture students. Nine questionnaires were given out to Form Four students in their classrooms per school, to enable the students to fill them. Filled questionnaires were collected from the students by the researcher. Likewise, questionnaires for agriculture teachers were given to them by the researcher upon their permission to complete the questionnaires, after which, the questionnaires were collected from the teachers by the researcher.

3.8 Data Analysis

The collected data relating to availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library), teachers' characteristics (age, qualification, experience, teaching method and attitude toward teaching), students characteristics (age, student career drives, gender, study habits, class attendance), as well, as family characteristics (family income, family size and family level of education) were sorted through cleaning and coding and then organized for easy analysis. Qualitative and Quantitative methods of data analysis were used with both descriptive as well as inferential statistics being applied to explain the results of the study. Using descriptive statistics helped the researcher to describe the population of study, while inferential statistics helped the researcher to make inferences about the population based on the results of a representative sample (Mugenda & Mugenda, 2003). This helped the researcher to generalize the findings of the study to the population. The types of descriptive statistics that were used included frequencies, percentages, means, as well as, standard deviations while inferential statistics used included Pearson correlation, Spearman's Rho and t-test, as well as, simple and multiple regression analysis.

Descriptive statistics enabled the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics to give expected summary statistics of variables being studied (Mugenda & Mugenda, 2003). Regression analysis was appropriate because it enabled the researcher to find out whether an independent variable predicts a given dependent variable and therefore, helped to explain the amount of variation explained by the independent variables. Inferential statistics was used in the explanation of the responses, which included use of correlation coefficient, as well as, simple and multiple regression analysis. The Alpha level was set at 0.05. The statistical package for social sciences was used in the data analysis. A multiple regression model of the following form was used to determine whether the independent variables predict the dependent variable.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots \beta_n X_n + \varepsilon$$

Where: Y- is the dependent variable (Academic performance in secondary school agriculture).

X_{1-n} – are the independent variables (Teaching and learning resources, Teacher characteristics, Student characteristics, and Family characteristics).

B_0 – is the constant

B_{1-n} – is the regression coefficients or change induced in Y by each X

ε – is the error

Simple regression model took the following form: $Y=B_0+B_1X_1+ \varepsilon$

Where: B_0 – is the constant or intercept

B_1 - is the slope or change in Y, given one unit change in

Y- is the dependent variable (Academic performance in secondary school agriculture).

X_1 – is the independent variable

ε – is the error

The results of the regression was then compared with stated hypothesis to establish whether selected factors influenced academic performance of students in secondary school agriculture in Rachuonyo North District.

Table 5:**Summary of Data Analysis**

Hypotheses	Independent variable	Dependent variable	Statistics
Ho₁ Availability of teaching and learning resources has no statistically significant influence on students' academic performance in agriculture.	Teaching and Learning resources	Academic performance in secondary school agriculture	Pearson correlation, Simple regression analysis
Ho₂ Teacher's characteristics have no statistically significant influence on students' academic performance in agriculture.	Teacher characteristics	Academic performance in secondary school agriculture	Spearman's Rho, Simple regression.
Ho₃ Students' characteristics have no statistically significant influence on students' academic performance in agriculture.	Students characteristics	Academic performance in secondary school agriculture	T-test, Pearson correlation.
Ho₄ Family characteristics have no statistically significant influence on students' academic performance in agriculture.	Family characteristics	Academic performance in secondary school agriculture	Pearson correlation, Multiple regressions.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents research findings, analysis and discussion of these findings so as to determine the influence of selected factors on academic performance of students in secondary school agriculture in Rachuonyo North District. All the questionnaires administered to 254 students and 30 agriculture teachers were all returned thus achieving 100 per cent response rate. This was achieved because the researcher personally administered the questionnaires, after which the researcher collected all the questionnaires from the respondents.

4.2. Description of Selected Factors Influencing Academic Performance of Students

The selected factors influencing performance were grouped into four main categories, which included, availability of teaching and learning resources (laboratory, classrooms, school farm, farm structures, textbooks and library), teachers' characteristics (age, qualification, experience, teaching methods and attitude toward teaching), students characteristics (age, student career drives, gender, study times, class attendance), as well as, family characteristics (family income, family size and family level of education). The Form Fours who took agriculture as one of their optional subjects were involved in the study. The students were studying in secondary schools within Rachuonyo North District; the schools included both boarding schools and day schools that were either boy's schools, girl's schools and mixed secondary schools. The teachers that participated in the study were also teaching in schools within Rachuonyo North District.

4.3. Availability of Teaching and Learning Resources and Students Academic Performance in Agriculture

4.3.1. Influence of availability of laboratory on the students' academic performance in agriculture

According to the study, 48.8% of the respondents indicated that laboratories were available in the school while, 18.5% indicated that laboratories were readily available in the school and 32.7% indicated that the laboratories were not available in the school (Table 6). In this study, it is evident that majority (67.3%) of the respondents had laboratories in their schools. However,

results of the study, found that schools without laboratories had a higher mean scores (49.0244) (Table 7) as compared to schools which had laboratories. From the findings, use of theoretical methods does not necessarily mean that laboratories are not needed. The laboratory can be there, but they are not gainfully used, and therefore, the students will continue performing poorly. These findings were inconsistent with other studies that reported that laboratory adequacy which is a school environment factor affect the performance of students in chemistry (Raimi, 2002 & Adeyegbe, 2005). In terms of academic achievement, Soyibo and Nyong (1984) have shown that schools with well-equipped laboratories have better results in the school certificate science examinations than those that are ill-equipped. Corroborating this, Gana (1997) reiterated that students instructed entirely by the laboratory methods had higher attitude's scores but lower achievement scores than students instructed entirely by the traditional lecture or textbook mode. Gamoran (1992), however, holding a contrary view noted that facilities, teachers' salaries, books in the library and the presence of science laboratory, had little impact on variation in student achievement, once student background variables had been taken into account. This study found that availability of laboratories had little impact on the performance of students in agriculture as majority of schools had laboratories, yet their performances in agriculture were still low despite the availability of laboratories, however, their adequacy, use of laboratories and whether laboratories are equipped or not could be influencing performance in agriculture.

Table 6
Responses on the Availability of the Laboratory

Laboratory availability	Frequency	Percent
Readily available	47	18.5
Available	124	48.8
Not available	83	32.7
Total	254	100

Table 7**Comparing Availability of Laboratory and Performance in 2012 Mock Examination**

Laboratory availability	Mean	N	Std. Deviation
Readily available	45.0638	47	15.77616
Available	47.9919	124	13.62476
Not available	49.0244	83	15.03246
Total	47.7826	254	14.51122

4.3.2. Influence of availability of classrooms on the students' academic performance in agriculture

From the analysis in terms of classroom availability, 36.7% of the respondents indicated that classrooms were readily available and 56.6% indicated that classrooms were available accounting for 93.3% of classroom availability while only 6.7% of the respondents indicated that classrooms were not available (Table 8). Schools that had classrooms had higher mean scores as compared to schools that did not have classrooms (Table 9). It is therefore, evident that availability of classrooms is influencing performance of students in secondary school agriculture. The study findings were consistent with a study conducted by Williams (1973), who succinctly said that school buildings are very vital input to educational system; emphasizing that even though they do not teach but their use may facilitate or impede learning. However, he did not see school building as one of the critical variables affecting school academic achievement because he found no evidence to show that an expensive school building would necessarily improve academic achievement. Giving credence to the above finding, Owoeye (1991) in his submission, expressed skepticism about any useful relationship between such expensive structures and academic achievement. The study, therefore, found a relationship between availability of classrooms and students' performance in agriculture.

Table 8**Agriculture Teachers Responses on Availability of Classrooms**

Classroom availability	Frequency	Percent
Readily available	11	36.7
Available	17	56.6
Not available	2	6.7
Total	30	100

Table 9**Comparing Teachers Responses on Classroom Availability and KCSE average Mean Score (2009-2011)**

Classroom availability	Mean Score KCSE	N	Std. Deviation
Readily available	6.1250	11	.92063
Available	6.1207	17	1.11827
Not available	4.7600	2	.07071
Total	6.0215	30	1.04840

4.3.3. Influence of availability of school farm on the students' academic performance in agriculture

A majority of the respondents (64.57%) indicated that the school farm was available and 31.1% indicated that the school farm was readily available, accounting for 95.67% school farm availability. However, 4.33% indicated that the school farm was not available (Table 10). The study however, found that schools that did not have school farms performed better (51.4) compared to than having school farms (Table 11). School farms are useful in the teaching of agriculture, especially during practical activities and demonstrations involving agronomic practices. The findings of the study are consistent with a study done by Zinnah and Adam (2003) that declared that many of the traditional ways of teaching are no longer fully adequate unless correctly accompanied with appropriate instructional strategies. They identified constraints to teaching– learning materials in Agricultural Science such as shortage of tools, and other equipment, lack of finance to provide the required materials and facilities, insufficient textbook for students and absence of school farms. Furthermore, Egun and Badmus (2007) in their

research study on reducing teachers' instructional difficulties in identified content areas of Agricultural Science discovered that lack of relevant instructional materials is among other reasons for teachers' difficulty in teaching certain content area of Agricultural Science syllabus. The findings of this study, found no relationship between school farm availability and students' performance in agriculture as indicated in Table 11.

Table 10

Agriculture Students Responses on Availability of School Farm

School Farm availability	Frequency	Percent
Readily available	79	31.1
Available	164	64.57
Not available	11	4.33
Total	254	100

Table 11

Comparing Availability of School Farm and Students Performance in 2012 Mock Examination

School Farm	Mean	N	Std. Deviation
Readily Available	47.7468	79	15.73048
Available	47.5793	164	13.80894
Not Available	51.4000	11	16.81402
Total	47.8976	254	14.59809

4.3.4. Influence of availability of agriculture textbooks on the students' academic performance in agriculture

Majority of the respondents (62.20%) indicated that the text books for agriculture were available and 33.07% indicated that textbooks were readily available accounting for 95.27% textbook availability. However, 6.7% of the respondents indicated that the textbooks for agriculture were unavailable (Table 12). The study found that schools where textbooks were available had higher mean scores (48.3208) than schools that did not have textbooks (Table 13). These findings were consistent with the findings of Glewwe, Kremer and Moulin, (2006) in Kenya which found that textbooks had effects only among the best students, perhaps because the textbooks were difficult

for most students. However, textbooks were found to raise test scores in the Philippines (Heyneman, Jamison & Montenegro, 1984). Earlier in his own contribution, Altbach (1983) reiterated that “nothing has ever replaced the printed word as the key element in the educational process and, as a result, textbooks are central to schooling at all levels”. In his empirical studies of use of textbooks and educational achievement involving 1,006 primary school pupils, Squire (1991), writing on teachers reliance on textbooks, stated that those seeking to improve the quality of education believed that improvements in instructional materials would inevitably lead to changes in actual teaching. Therefore, the study found that textbooks influences students’ performance in secondary school agriculture.

Table 12

Agriculture Students Responses on Availability of Agriculture Textbooks

Textbook availability	Frequency	Percent
Readily Available	84	33.07
Available	158	62.20
Not Available	12	4.73
Total	254	100

Table 13

Comparing Availability of Agriculture Textbooks and Students Performance in 2012 Mock Examination

Textbooks availability	Mean	N	Std. Deviation
Readily Available	47.1786	84	15.59901
Available	48.3208	158	14.06644
Not available	44.3000	12	12.50822
Total	47.8976	254	14.59809

4.3.5. Influence of availability of farm structures on the students’ academic performance in agriculture

From the analysis, majority of the respondents (60.62%) indicated that the farm structures were unavailable, while 33.30 indicated that farm structures were available and another 7.08%

indicated that farm structures were readily available accounting for 39.38% farm structure availability (Table 14). The study found that schools without farm structures had a higher mean scores (49.4156) compared to schools that had farm structures (Table 15). The study findings were consistent with the findings of Egun and Badmus, (2007) while commenting on the teaching of Agricultural Science in Nigerian secondary schools; their study revealed that the subject was taught in the classroom theoretically without practical work and the use of relevant instructional materials. As a result of the poor method of teaching, students see the subject as difficult, hence, they develop negative attitude towards it. Similarly, Egun and Badmus, (2007) in his research on reducing teachers' instructional difficulties in identified content area of Agricultural Science discovered that lack of relevant instructional materials is among other reasons for teachers' difficulty in teaching certain content areas of Agricultural Science syllabus. From the findings, farm structure availability seems not to influence academic performance of students in secondary school agriculture, since performance was higher in schools without farm structures than schools with farm structures.

Table 14
Agriculture Students Responses on Availability of Farm structures

Farm structure availability	Frequency	Percent
Readily available	18	7.08
Available	82	32.30
Not available	154	60.62
Total	254	100

Table 15
Comparing Availability of Farm structures and Students Performance in 2012 Mock Examination

Availability of Farm structures	Mean	N	Std. Deviation
Readily available	45.2222	18	15.62259
Available	45.2469	82	15.60251
Not available	49.4156	154	13.62221
Total	47.8976	254	14.59809

4.3.6. Influence of availability of library on the students' academic performance in agriculture

Regarding the availability of the library resource 23.2% indicated readily available and 54% indicated available accounting for 77.2% library availability, while 22.8% indicated they did not have a library (Table 16). According to the study, schools that had libraries readily available had higher mean scores (49.322) compared to schools without library (Table 17). From this study, many schools had libraries, and this influenced academic performance of students in secondary school agriculture. Schools that did not have libraries had a lower mean score in examinations. On availability of libraries does sometimes have a negative influence on performance of students in secondary school agriculture as students do not have a place for private studies in school. Studies have established significant relationship between library and students' academic performance. For instance, Keith (2004) in his study found that the size of a library media programme as indicated by the size of its staff and collection is the best school predictor of academic achievement of students. In addition, the instructional role of the library media specialist shapes the collection and in turn academic achievement. Finally, the degree of collaboration between library media specialist and classroom teacher is affected by the ratio of teachers to pupils. In a related study, Waldman (2003) discovered that students visit library for different purposes. This purpose, therefore, has a strong influence on their performance. In other studies (Lance, 2000; Todd & Kuhlthau, 2004) have confirmed a significant correlation between the presence and the use of library materials by students and teachers with better student performance. Similarly, a correlation was found between the school inputs and better student achievement (Todd & Kuhlthau, 2005). The discussion continued as to whether school facilities have effects on student achievement. Government of Pakistan (2005) showed the mixed effects of school facilities. According to the study, the availability of a library, did not affect student achievement. Similarly, Yousaf (2005) found that physical facilities were not favorable for students' successful transition to higher education. According to Farombi (1998), school libraries may not be effective if the books therein are not adequate and up-to-date as its impact may only be meaningful if the library could be opened to the students always for a considerable length of time in a school day. With all the above mentioned facts, it is sad to observe that many schools operate without libraries (Shodimu, 1998) whereas Ogunseye (1986) had earlier noted that total

absence of an organized school library would continue to spell doom for thousands of secondary school students. This statement clearly implied that many schools operate without libraries and had affected the academic performance of their students. Similarly, in another study, Fuller (1986) identified a school library as an instructional resource which may significantly influence pupils' achievement after controlling for pupils' family background. He found that effect of library size and its activity have been positive in 15 out of 18 analyses. The study found that availability of library is influencing performance of students in secondary school agriculture.

Table 16
Agriculture Students Responses on Availability of Library

Library	Frequency	Percent
Readily available	59	23.2
Available	137	54.0
Not available	58	22.8
Total	254	100.0

Table 17
Comparing Library Availability and Students Performance in 2012 Mock Examination

Library availability	Mean	N	Std. Deviation
Readily Available	49.3220	59	15.59116
Available	47.5956	137	14.22120
Not available	46.6552	58	14.17008
Total	47.8976	254	14.59809

4.4. Teachers' Characteristics and Students Academic Performance in Agriculture

4.4.1. Teachers demographic data

The agriculture teachers were requested to give information pertaining to their age and gender. Their information was represented using frequencies and percentages. According to Table 18, a majority of the agriculture teachers (70%) were male compared to their (30%) female counterparts. This shows that male agriculture teachers are more in secondary schools compared to female agriculture teachers, in Rachuonyo North District

Table 18**Gender Distribution of the Agriculture Teachers**

Gender	Frequency	Percent
Male	21	70
Female	9	30
Total	30	100

4.4.2. Influence of teachers' age on the students' academic performance in agriculture

From the analysis, 33.3% of the teachers were between the ages of 25-29 years old, while 3.3% of the teachers were above 40 years (Table19). The study established that teachers' age did not influence students' performance as evident on KCSE average mean scores (Table 20). This finding is consistent with the works of Adeniji (1999) and Okoruwa (1999), who reported that, age of the teacher alone cannot influence academic achievement, and therefore, students' performance are influenced by several factors. Similarly, in another study concerning teacher's age and achievement, Okoruwa (1999) found that teacher's age had no significant influence in the achievement of pupils taught by teachers of different age groups

Table 19**Age Distribution of Agriculture Teachers**

Age	Frequency	Percent
20-24	8	26.7
25- 29	10	33.3
30- 34	5	16.7
35- 39	4	13.3
40 – 44	2	6.7
Over 45	1	3.3
Total	30	100

Table 20**Comparing Age of the Teacher and KCSE Average Mean Score (2009-2011)**

Age of the Teacher	Mean Score KCSE	N	Std. Deviation
20 – 24	5.1725	8	.70258
25 – 29	6.3800	10	.89220
30 – 34	5.7860	5	1.22112
35 – 39	6.4740	4	1.23775
40 – 44	5.0900	2	.53740
Over 45	6.6100	1	.
Total	6.0215	30	1.04840

4.4.3. Influence of teachers' academic qualification on the students' academic performance in agriculture

From the analysis, majority of the respondent teachers (56.7%) had a bachelor's degree in agricultural education, while 36.7% had a diploma as their highest professional qualification. Only 3.3% had certificate in agriculture and Master of Science in agricultural education (Table 21). This therefore, means that most agriculture teachers are well trained to teach agriculture in the district, the study therefore, found that training seems to have some influence on academic performance of students in agriculture, since students taught by teachers who had master's degree had a higher mean score (6.3200) compared to other qualifications (Table 22). This finding is consistent with the findings of Darling – Hammond (2000); Sparks (2000); Osokoya (1999); Sanders and Rivers (1996) who found separately that, teacher's qualification significantly and positively correlated with student learning outcomes in science. Similarly, concerning teacher's qualification, Darling – Hammond (2000) found that teacher quality characteristics such as certification status and degree in subject to be taught are very significant and positively correlated to subject outcomes in science and mathematics. Similarly, Ingersoll (1999) found out in a study that 63% chemistry, physics, earth and space science instructors did not have certification in the subjects and this resulted in the poor performance of students.

Table 21**Highest Professional Training of the Agriculture Teachers**

Teacher's Training	Frequency	Percent
Certificate in Agriculture	1	3.3
Diploma Agric. Education	11	36.7
BSc. Agric. Education	17	56.7
MSc. Agric. Education	1	3.3
Total	30	100

Table 22**Comparing Teacher's Training and KCSE Average Mean Score (2009-2011)**

Teacher's Training	Mean KCSE	N	Std. Deviation
Certificate in agriculture	5.3300	1	.
Diploma Agric. Educ.	6.1290	11	.96980
BSc. Agric. Educ.	5.9760	17	1.17714
MSc. Agric. Educ.	6.3200	1	.
Total	6.0215	30	1.04840

4.4.4. Influence of teacher's teaching experience on the students' academic performance in agriculture

From the analysis, 63.3% of the respondent teachers had less than five (5) years' experience in teaching while 26.7% of the agriculture teachers had 5-10 years' experience. 6.7% of the teachers had 11-15 years teaching experience and only 3.3% had experience of 16-20 years of teaching (Table 23). Teaching experience was found to influence performance of students because more experienced teachers had a higher mean score (8.5300) in their subjects compared to the least experienced teachers which had a mean score of (5.8707) (Table 24). Experienced teachers may have mastered teaching techniques, subject content and examination techniques compared to teachers who had few years in terms of teaching experience. From the analysis, majority of agriculture teachers in Rachuonyo North District had few teaching years hence less experienced and this may have influenced students' performance in secondary school agriculture.

This finding is consistent with another study done by Hansen (1988) who found that teachers who have spent more time studying and teaching were more effective overall and they developed higher order thinking skills for meeting the needs of diverse students, hence increasing their performance. Similarly, Okoruwa (1999) found that teachers' teaching experience had significant effect on students' achievement in science.

In addition, Ijaiya (2000) reported that experience improves teaching skills while pupils learn better at the hands of teachers who have taught them continuously over a period of years. In investigating possible differences in teaching strategies, Schuler (1984) grouped teachers into three levels of teaching experience (3 - 6; 7 - 10 and more than 10 years). His findings revealed that experienced teachers' perception of their teaching objectives was significantly more subject-oriented than was that of first-year teachers. Hence, effective teaching could be measured by the level of a teacher's subject matter competence which Mullens (1993) regarded as a prime predictor of student's learning.

Table 23
Agriculture Teachers Teaching Experience

Teaching Experience	Frequency	Percent
Less than 5 years	19	63.3
5 -10 years	8	26.7
11- 15 years	2	6.7
16 - 20 years	1	3.3
Total	30	100

Table 24
Comparing Age of the Teacher and KCSE Average Mean Score (2009-2011)

Teacher's Teaching Experience	Mean score KCSE	N	Std. Deviation
Less than 5 years	5.8707	19	1.05925
5 -10 years	6.0744	8	.71974
11- 15 years	5.6600	2	1.34350
16 - 20 years	8.5300	1	.
Total	6.0215	30	1.04840

4.4.5. Influence of teacher's teaching method on the students' academic performance in agriculture

When the teaching method preferred by teachers were compared to mean score for the schools in past KCSE agriculture examinations, it was found that the demonstration and field trip methods had the highest mean score (6.7) followed by those who preferred lecture, project, field trips and discussion methods with a mean score of 6.4, and the least preferred method of teaching was lecture and discussion method with a mean of 4.29 (Table 25). The study therefore, found that teacher's teaching method influenced student's performance. This study is consistent with Harb and El-Shaarawi, (2006) that found that a good match between students' learning preferences and instructor's teaching method had positive effect on student's performance. According to Reid (1995), learning preference refers to a person's "natural, habitual and preferred way" of assimilating new information. This implies that individuals differ in regard to what mode of instruction or study is most effective for them.

Scholars, who promote the learning preferences approach to learning, agree that effective instruction can only be undertaken if the learner's learning preferences are diagnosed and the instruction is tailored accordingly (Pashler, McDaniel, Rohrer, & Bjork, 2008). Indeed, Omrod (2008) reported that some students seem to learn better when information is presented through words (verbal learners), whereas others seem to learn better when it is presented in the form of pictures (visual learners). Clearly in a class where only one instructional method is employed, there is a strong possibility that a number of students will find the learning environment less optimal and this could affect their academic performance. Similarly, Felder (1993) established that alignment between students' learning preferences and an instructor's teaching method leads to better recall and understanding.

Table 25**Teaching Method Compared to Performance of Students in KCSE 2009-2011**

N=30

Teaching Method	KCSE mean		Standard
	2009-2011	N	Deviation
All methods	6.2233	3	1.16967
Discussion method	6.0600	8	1.05423
Demonstration method and field trip method	6.7000	2	.
Field trip method/demonstration	5.0100	3	.
Project method/demo. method/discussion method	5.5033	3	1.11096
Lecture/project/discussion	5.8250	2	0.70004
Demo/field trip/discussion method	4.8100	3	.
Lecture/discussion	4.2900	3	.
Lecture /project/field trips/discussion method	6.4000	3	0.74960

4.4.6. Influence of teacher’s attitude on the students’ academic performance in agriculture

When statements relating to attitudes about teaching agriculture were asked, majority of the respondents expressed a positive attitude since in most of the statement the responses were either strongly agree or agree. Most teachers (63.3%) strongly agreed that teaching agriculture is interesting and it develops reasoning ability and only 8% of the teachers strongly agreed that teaching agriculture encourages students to engage in agricultural activities at home (Table 26). From this study, it was found that most teachers had a positive attitude towards teaching agriculture. In a study done by Fazio and Roskes (1994), they reiterated that “attitudes are important to educational psychology because they strongly influence social thought; the way an individual thinks about and process social information”. According to Eggen and Kauchak (2001), positive teachers’ attitudes are fundamental to effective teaching. A teacher must be interesting. That is the teacher must work his students into such a state of interest in what he/she is going to teach them such that every other object of attention is banished from their minds. The teacher should also fill the students with devouring curiosity to know the next steps in

connection with the subject are. In another study, Morakinyo (2003) believed that the falling level of academic achievement is attributable to teacher's non-use of verbal reinforcement strategy. The study found that the attitude of some teachers to their job is reflected in their poor attendance to lessons, lateness to school, unsavory comments about student's performance that could damage their ego, poor method of teaching and the likes, affect pupils' academic performance.

Table 26
Teachers' Attitudes toward Teaching Agriculture

	Strongly Agree		Agree		Not sure		Disagree		Strongly Disagree		Total	
	Freq.	%	Freq	%	Freq	%	Fq.	%	Frq	%	Frq	%
Teaching agric. encourages students to engage in agric. activities at home	8	26.7	16	53.3	4	13.3	1	3.3	1	3.3	30	100
Teaching agric. is beneficial to the school	10	33.3	18	60	2	6.7					30	100
Teaching agriculture is interesting	19	63.3	9	30	1	3.3			1	3.3	30	100
Teaching develops reasoning ability	19	63.3	8	26.7	2	6.7			1	3.3	30	100
Am satisfied with teaching agriculture	13	43.3	15	50	1	3.3			1	3.3	30	100
Teaching agriculture is interesting career	13	43.3	16	53.3					1	3.3	30	100

4.5. Students' Characteristics and their Academic Performance in Agriculture

4.5.1. Influence of students age on the students' academic performance in agriculture

The study found that most of the respondents were 18years old (47.6%) while 22.6% were 17years old and 12.2% were 19 years old (Table 27). The growth and development of a person has positive influence on a person's mental development, as a result, the performance of students is likely to improve as a student age increases. According to Entwisle (1986) and Goldberg (1994) they found in their study that most science students begin their career with a desire to learn and with an intrinsic approach to achievement, which later switches to a more extrinsic orientation as students increase in age. In another study, Richardson (1994) concluded in his study by making the observation that mature students were rather more likely than younger students to adopt a deep approach or a meaning orientation towards their academic work, and was conversely less likely than younger students to adopt a surface approach or a reproducing orientation.

Table 27

Student's Respondents Age

Age	Frequency	Percent
14	1	0.4
15	2	0.8
16	16	6.3
17	57	22.4
18	121	47.6
19	31	12.2
20	17	6.7
21	7	2.8
24	1	0.4
25	1	0.4
Total	254	100

4.5.2. Influence of students career drives on the students' academic performance in agriculture

The study observed that majority of the students (49.6%) would wish to pursue agriculture related careers while 21.3% would wish to pursue engineering related careers and 14.9% would wish to pursue careers in medicine (Table 28).

Table 28**Career Preference of the Student Respondents**

Career Drive	Frequency	Percent
Agriculture related	126	49.6
Engineering related	54	21.3
Medical related	38	14.9
Business related	13	5.1
Teaching related	18	7.1
Others	5	2.0
Total	254	100

When comparison between students' performance in agriculture mock examination and career choice was done, the study showed that the students who prefer a future career in agriculture related disciplines had a higher mean (51.25) followed by those who indicated they would prefer medical related careers (50.13) as compared to those who indicated that they would wish to pursue engineering, teaching and business career (Table 29).

Thus it does seem in this study that the choice of the career one prefers to pursue in future does influence performance. The level of career aspiration usually affects curriculum choice hence career choice (Herr & Cramer, 1996). Also, career aspirations are influenced by numerous factors including gender, race, parental support, academic achievement, socioeconomic status, and self-esteem. Similarly, several factors which have been found to be theoretically and empirically related to career aspirations also influence the career choice process. Some of these factors include gender (Jones & Larke, 2001), parents' occupation (Stone & Wang, 1990), and parents' level of education (Jones & Larke, 2003).

Table 29**Career Choice and Performance of Students in 2012 Agriculture Mock Examination in Rachuonyo North District**

Career to pursue in future	Mean	N	Standard Deviation
Agriculture related	51.25	116	15.41
Engineering related	47.83	62	13.34
Medical related	50.13	44	16.48
Business related	38.50	12	10.79
Teaching related	46.50	20	16.54
Total	49.24	254	15.20

4.5.3. Influence of students gender on the students' academic performance in agriculture

The study found that male students were more (62.6%) compared to female students 37.4% (Table 30). Stokes (1990) reported that there was no significant effect of gender on learning mathematics. Young and Fraser (1994) conducted a study on gender differences in science achievement, and the relative contribution of schools to student achievement was examined; and school level differences were found to contribute significantly toward explaining variations in student performance. Although statistically significant sex differences on performance were found in physics achievement for 10-year old, 14-year old and 12 year old students. School effects were much more powerful in explaining student differences when compared with gender. In addition, Ahmed (1998) also reported that the influence of gender on achievement motivation was found to be non-significant.

Table 30**Gender of the Student Respondents**

Gender	Frequency	Percent
Male	159	62.6
Female	95	37.4
Total	254	100

A comparison between performance and gender of the student revealed that female students had a slightly higher mean of (48.30) compared to performance of male student's which had a mean of (47.65) in Rachuonyo North District (Table 31). This means that girls slightly perform better than boys and this may be attributed partly to female students being more conscientious and thus less likely to miss classes. In this study, students' gender seems to be influencing academic performance of students in agriculture. This finding is consistent with other studies that found that girls showed better performance than boys in certain instances (Chambers & Schreiber, 2004). In addition, Gender, ethnicity, and father's occupation are significant contributors to student achievement (McCoy, 2005). Based on an analysis of close to two million graduating students, Woodfield and Earl-Novell (2006) found that female students outperformed male students and attributed this partly to female students being more conscientious and thus less likely to miss lectures.

Table 31

Mean Performance of Students per Gender in 2012 Rachuonyo North District

Agriculture Mock Examination

Gender of the respondent	Mean	N	Std. Deviation
Male	47.6541	159	15.06105
Female	48.3053	95	13.85723
Total	47.8976	254	14.59809

4.5.4. Influence of students preferred study times on the students' academic performance in agriculture

The respondents chose several options when they preferred to study. Majority (20.4%) indicated they prefer to study at class time and prep time, while the least preferred option was at dawn and during holiday (Table 32). Rao (1970) on his study on some factors related to scholastic achievement, found that a correlation between study habits and scholastic achievement was negative but very low non-significant, but there was a positive significant relationship between study habits and school attitude. Thus a pupil who has favourable attitude towards the school was likely to have good habits of study and tends to be well disposed towards the school. In another study, Girija et al. (1975) in their study on study habits and academic achievement of 181 first year and 121 final year students of Agriculture College, they found that students at different

levels of degree programme under trimester system did not differ very much in their study habits. Similarly, Sharma (1986) study revealed a significant influence of study habits on academic achievement.

Table 32
Preferred Study Times of the Student Respondents

Study Times	Frequency	Percent
Class time	9	3.5
Prep time, Dawn time, at home, and holidays	26	10.2
All the five options	42	16.5
Dawn and during holidays	6	2.4
Preps time	12	4.7
Dawn Time	8	3.1
Class time, Preps time, at home and during holidays	28	11.4
Class time , Preps time and During holidays	15	5.9
Class time, and prep time	19	7.5
Class time and dawn time	10	3.9
Prep time and dawn time	26	10.2
Class time, prep time and dawn time	52	20.4
Total	254	100

While comparing students' preferred study time and performance in mock examination, the respondents chose several options when they preferred to study. Majority (52 respondents) indicated they preferred to study at class time, prep time and dawn time. The group with the highest mean score 53.95 (Table 33) indicated that they preferred to study during class time and preps, thus it does seem that the students who take their work seriously during class time and

prep time, perform better than those who chose more options. It can also mean that those who only chose class time and prep time to study are brighter than those who have to look for extra time to study and thus their mean score is high. In this study therefore, it seems that study habit influences students' performance in agriculture. This finding is similar to the findings of Saxena (1988) that revealed that study habits were positively related to achievement in all the streams of the study (Math, Biology, Commerce and Arts). Better study habits characterized the over-achieving group, implying that higher achievement required a systematic and planned approach to preparing lessons, a proper distribution of time, careful attention in the classroom, taking of meaningful notes and formation of expressive answers. In general over achievers are those who had better study habits. However, in a study, Beedawat (1984) reported that poor and bad study habits were not solely responsible for under achievement.

Table 33
Preferred Study Times and Performance in 2012 Agriculture Mock Examination in
Rachuonyo North District
N=254

Study Times of the Respondent	Mean	N	Standard Deviation
Class time	44.0000	9	13.21930
Prep time, Dawn time, at home, during holidays	42.6923	26	12.88959
All the five options	48.9762	42	13.93975
Dawn and during holidays	51.5000	6	10.98636
Preps time	47.9167	12	15.81402
Dawn Time	50.1250	8	13.11964
Class time, Preps time, at home and holidays	50.5862	29	15.87792
Class time , Preps time and during holidays	40.9333	15	14.91627
Class time, and prep time	53.9474	19	12.02531
Class time and dawn time	46.8000	10	18.87267
Prep time and dawn time	47.2692	26	16.19026
Class time, prep time and dawn time	48.3654	52	14.43583
Total	47.8976	254	14.59809

4.5.5. Influence of students class attendance on the students' academic performance in agriculture

When the teacher respondents were asked whether students missed classes, majority of them (17/30) said they did while some said sometimes they were absent (8/30) while (5/30) indicated they don't miss the classes. When class attendance was compared with performance it was found that those who indicated the students did not miss classes showed a higher mean score (6.205) as compared to those who indicated they sometimes miss (6.12) and those who seems to indicate they always missed (5.93) (Table 34). Studies by Mwinzi and Kimengi (2006), and Jagero (1999) in Kenya indicated that being sent home frequently to collect fees balances interfered with students' learning, and consequently their academic performance. On average students take up to one week per month to report back to school, in total the student ends up missing an average of one month per term which translates to one term per year (Mwinzi & Kimengi, 2006). The consequences of missing classes have far reaching effects on the students that include increasing probability of dropping out, discouraging hard work, and stressing the students while they are trying to cover missed lessons, hence, increase chances of failing (Mwinzi & Kimengi, 2006). According to Mensch and Lloyd (1997), school-based factors that reduce the learning time include disruptions due to teachers' absence and missed classes for chores or punishments. Some of the chores performed at school involved preparing and serving food, running errands, and assisting teachers in their homes.

Table 34
Class Attendance and Performance in KCSE Agriculture Examination (2009-2011)

Student attendance in agriculture lessons	Average mean score between 2009-2011	N	Standard Deviation
Yes	5.9325	17	1.29911
No	6.2050	5	.69251
Sometimes	6.1200	8	.49907
Total	6.0215	30	1.04840

The study found that students who did not miss classes had a higher mean score of 48.24, while students who miss classes had a lower mean score of 46.91 (Table 35). This means that students

who regularly attend classes perform better than those who miss classes. Therefore, it was observed that class attendance influences students' performance in agriculture. In one of his studies, Romer (1993) reported that the major reasons given by students for non-attendance included assessment pressures, poor delivery of lectures, timing of lectures, and work commitments (Newman-Ford, Lloyd & Thomas, 2009). However, Durden and Ellis, (1995) controlled for student differences in background, ability and motivation, and reported a nonlinear effect of attendance on learning, that is, a few absences do not lead to poor grades but excessive absenteeism does.

Table 35

Students Responses on Class Attendance Compared to Performance in 2012 Agriculture Mock Examination in Rachuonyo North District

Students missing classes	Mean	N	Standard Deviation
Yes	46.9153	59	13.78816
No	48.2410	166	14.68175
Sometimes	47.9310	29	16.08666
Total	47.8976	254	14.59809

4.6. Family Characteristics and Students Academic Performance in Agriculture

4.6.1. Influence of family income on the students' academic performance in agriculture

From the analysis, majority among the students' respondents (42.5%) indicated to come from families which earned between Ksh.00 – 2000 per month and 28.3% indicated that their family earnings were between Ksh. 2001-5000 per month, while 0.4% earned over Ksh. 50,001 (Table 36). In this study, it is evident that most parents from this district were poor, and this does not influence performance of students in agriculture negatively, since, students coming from families with the lowest monthly income had higher mean score (49.7083) as compared to students coming from families with the highest monthly income (Table 37). The finding of the study is similar to other studies done by Mathur and Hundal (1972) which indicated that the annual family income bore only a moderate correlation with academic achievement. Similarly, Saini's (1977) study results revealed a positive correlation between academic achievement and economic status of parents. On the other hand Krishnan (1977) revealed that the extreme income

groups (high and low) alone differed significantly with respect to achievement whereas the mean difference between high and middle income groups and the mean difference between middle and low income groups were not significant. However, Sood (1990) study on academic achievement of pre-engineering students in relation to socio-economic status showed that there was no significant relationship between academic achievement and socio-economic status.

In another study, Drummond and Stipek (2004), while discussing “Low-income Parents’ beliefs about their role in children’s academic learning”, mentioned that a few of these parents indicated that their responsibilities were limited to meeting children’s basic and social emotional needs, such as providing clothing, emotional support, and socializing manners. So these parents’ failure toward their responsibilities in the educational processes of their children and scarcity of fund to intensify such processes could be a challenge to their children’s success. In another study, it was found that socio-demographic variables do not fully account for the academic successes or failure of minority students (Smith, Schneider, & Ruck, 2005). But previous studies in the same field have established that other factors in spite of SES can boost academic successes among students.

Table 36
Family income in Rachuonyo North District

Income (kshs)	Frequency	Percent
00- 2000	108	42.5
2001-5000	72	28.3
5001-10000	30	11.8
10001- 15000	15	5.9
15001- 20000	15	5.9
20001- 50000	13	5.1
Over 50001	1	0.4
Total	254	100

Table 37**Comparing Family's Monthly Income and Performance in 2012 Mock Examination**

Family's Monthly Income	Mean	N	Std. Deviation
00- 2000	48.3056	108	13.75585
2001-5000	49.7083	72	14.65513
5001-10000	46.6667	30	13.61625
10001- 15000	45.0000	15	16.06682
15001- 20000	45.2667	15	22.03720
20001- 50000	45.1538	13	11.71072
Over 50000	29.0000	1	.
Total	47.8976	254	14.59809

4.6.2. Influence of family size on the students' academic performance in agriculture

The study found that majority (37.8%) of the respondents had 5-8 dependants in their respective homes whereas about 36.2% of the respondent students had 9-12 people living in their respective homes (Table 38). The study established that students coming from smaller family size had a higher mean score (54.3500) as compared to students coming from larger family size (Table 39). Thus in Rachuonyo North District most of the families had high number of dependants making the families to apportion little resources to different competing interests such as basic human needs, as well as, education and this influences students' performance in schools. In a study on family size and academic achievement of children, Cherian (1990) found a negative relationship between family size of children and their academic achievement. Similarly, Poonam and Balda (2001) study revealed that, family size was negatively correlated with IQ of children. Above implies that children from small size families compared to larger families are academically good. However, Devi and Kiran (2002) reported that large family size, low educational status of parents, low parental involvement and low parental encouragement were found to be the major family factors associated with scholastic backwardness on a study on family factors associated with scholastic backwardness of secondary school children in Hyderabad city.

Table 38**Family Size of the Respondent Students**

Family Size	Frequency	Percent
1-4	21	8.3
5-8	96	37.8
9-12	92	36.2
13-16	24	9.4
17-20	11	4.3
21-24	5	2
25-28	3	1.2
Over 28	2	0.8
Total	254	100

Table 39**Comparing Family's Size and Performance in 2012 Mock Examination**

Family's Size	Mean	N	Std. Deviation
1-4	54.3500	20	16.70573
5-8	47.6316	95	15.32003
9 – 12	46.8925	93	12.72746
13 – 16	47.5600	26	15.75881
17 – 20	49.3636	11	18.40257
21 – 24	53.2000	5	12.13260
25 – 28	36.5000	2	10.60660
Over 28	42.0000	2	8.48528
Total	47.9368	254	14.61367

4.6.3. Influence of family level of education on the students' academic performance in agriculture

Most of the respondents' fathers (35.4%) had been to school up to secondary level while 25.6% of the respondents fathers had attained college education and 28% of the respondents' fathers

had primary education while 4.7% had no formal education as compared to 6.3% who had attained a university level of education (Table 40). The study found that students whose fathers had no formal education had a higher mean score (52.1667) compared to students whose parents had university education (Table 41). This therefore, means that father's education had little influence on students' performance. In other studies, parental education and family SES level were found to have positive correlations with the student's quality of achievement (Jeynes, 2002a). The students with high level of SES perform better than the middle class students and the middle class students perform better than the students with low level of SES (Garzon, 2006) and (Kirkup, 2008). However, the achievement of students was negatively correlated with the low SES level of parents because it hindered the individual in gaining access to sources and resources of learning (Eamon, 2005). Low SES level strongly affects the achievement of students, dragging them down to a lower level (Sander, 2001). This effect is most visible at the post-secondary level (Trusty, 2000). It is also observed that the economically disadvantaged parents are less able to afford the cost of education of their children at higher levels and consequently they do not work at their fullest potential (Rouse & Barrow, 2006). Similarly, Krashen (2005) concluded that students whose parents were educated scored higher on standardized tests than those whose parents were not educated. Educated parents could better communicate with their children regarding the school work, activities and the information being taught at school.

Table 40
Level of Education of the Respondents' Father

Education Level	Frequency	Percent
No formal education	12	4.7
Primary level	71	28
Secondary level	90	35.4
College	65	25.6
University	16	6.3
Total	254	100

Table 41**Comparing Father's Education Level and Performance in 2012 Mock Examination**

Father's Education Level	Mean	N	Std. Deviation
No formal education	52.1667	12	16.19109
Primary level	49.9155	71	14.25557
Secondary level	48.3889	90	14.33601
College	45.5538	65	14.04906
University	42.5000	16	17.37815
Total	47.8976	254	14.59809

Majority of the guardians (22.8%) had secondary education while 21.3% of the respondents' guardians had no formal education, whereas, 20.9% had primary education and 16.9% had university level of education, while 18.1% had college education (Table 42). The study found that students whose guardians had college education performed better (49.0000) compared to students whose guardians had primary education (Table 43). Therefore, guardians' education level was found to influence students' performance. Moreover, according to Hammer (2003), the home environment is as important as what goes on in the school. Important home environment factors include parental involvement in their children's education, how much TV they watch and family size. Parental influence has been identified as an important factor affecting student achievement. Results indicate that parent education and encouragement are strongly related to improved student achievement (Wang, Wildman, & Calhoun, 1996).

Table 42**Level of Education of Respondent's Guardian**

Education Level	Frequency	Percent
No formal education	30	22.05
Primary level	29	21.32
Secondary level	34	25.00
College	23	16.91
University	20	14.72
Total	136	100

Table 43**Comparing Guardian's Education Level and Performance in 2012 Mock Examination**

Guardian's Education Level	Mean	N	Std. Deviation
No formal education	46.5333	30	13.50538
Primary level	44.1724	29	12.64648
Secondary level	48.1471	34	15.11799
College	49.0000	23	14.63495
University	46.5000	20	19.04151
Total	46.8456	136	14.72910

Majority (41.7%) of the respondent mother's level of education had primary level education, 32.3% had secondary level education, 14.2% had college level education, and 7.5% had no formal education, while 4.3% had university level of education (Table 44). The study observed that students whose mothers had no formal education had higher mean score (53.8947) compared to students whose mothers had attained university education, therefore, mothers education level was found not to influence students' performance in agriculture (Table 45). This finding is contrary to the finding done by Phillips (1998) who found that parental education and socio-economic status have an impact on student achievement. Students with both parents having college education tended to achieve at the highest levels, but family size was modestly related to achievement (Ferguson, 1998). As earlier mentioned, in general, parents become less involved as their children get older (Pena, 2000). This may be because parents feel less able to help as their children get older and the school work becomes more difficult. However, Shumow and Miller (2001) found that parents of low achieving adolescent students are more likely to be involved at home than parents of successful students.

Table 44**Level of Education of the Respondent's Mother**

Education Level	Frequency	Percent
No formal education	19	7.5
Primary level	106	41.7
Secondary level	82	32.3
College	36	14.2
University	11	4.3
Total	254	100

Table 45**Comparing Mother's Education Level and Performance in 2012 Mock Examination**

Mother's Education Level	Mean	N	Std. Deviation
No formal education	53.8947	19	15.12134
Primary level	48.6792	106	13.75815
Secondary level	45.5244	82	14.68116
College	48.5000	36	15.86461
University	45.7273	11	15.43432
Total	47.8976	254	14.59809

4.7. Hypothesis Testing on Performance of Students in Secondary School Agriculture**4.7.1. Influence of teaching and learning resources on academic performance of students' in agriculture**

H₀₁ Availability of teaching and learning resources has no statistically significant influence on students' academic performance in agriculture.

When analysis of variance was done, the F statistics was found to be 2.599 with a significance value of more than 0.05 (.119) (Table 46). This was also supported by the t-value of the independent variable being less than 1.96 where t- value was 1.612 (Table 47), meaning that the teaching and learning resources was not a significant predictor of the dependent variable (students' performance in agriculture) in Rachuonyo North District. Thus the null hypothesis was

accepted, because the p value was 0.119 (Table 47) which was greater than 0.05. This means that the relationship was not reliable, hence, cannot be used to make predictions. Thus, availability of teaching and learning resources considered, did not have statistically significant influence on students' academic performance in agriculture in Rachuonyo North District.

Table 46
Analysis of Variance on Teaching and Learning Resources
ANOVA^b

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2.691	1	2.691	2.599	.119(a)
Residual	25.886	25	1.035		
Total	28.578	26			

a Predictors: (Constant), Number of available teaching and learning resources

b Dependent Variable: Average mean score of K.C.S.E between 2009-2011

Table 47
Regression Coefficients on Teaching and Learning Resources
Coefficients^a

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.807	.778		6.177	.000
Number of available teaching and learning resources	.293	.182	.307	1.612	.119

a Dependent Variable: Average mean score of K.C.S.E between 2009-2011

Linear regression results yielded a t-value of -0.1547 which was less than 1.96, with a significance of 0.123 (Table 48) which was greater than 0.05. This means that the teaching and learning resources considered were not a significant predictor of the students' performance in

agriculture in Rachuonyo North District. Thus the null hypothesis was accepted, because performance in secondary school agriculture was not significantly influenced by the availability of teaching and learning resources in Rachuonyo North District.

Table 48

Regression Analysis on Teaching and Learning Resources and Performance in Agriculture Mock Examination

		Coefficients ^a				
		Unstandardized		Standardized		
		Coefficients		Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	53.944	4.012		13.445	.000
	Number of teaching and learning resources available	-1.608	1.039	-.097	-1.547	.123

a. Dependent Variable: marks in Percentage

4.7.2. Influence of teacher’s characteristics on academic performance of students’ in agriculture

H₀₂ Teacher’s characteristics have no statistically significant influence on students’ academic performance in agriculture.

When a correlation was done between the number of years of teaching and performance of students in agriculture, the results gave a rho value of 0.424 (Table 49) meaning that performance seems to improve with increase in the number of years of teaching. This finding is consistent with the finding of Felder (1993) who investigated the relationship between measures of teachers’ experience and student achievement in science and mathematics found that teaching experience as measured by years of service correlated positively with student test results. However, in another study, Greenwald, Hedges and Laine (1996) asserted that achievement was positively correlated with teacher’s qualification. However, Osokoya (1999) found little or no significant relationship between teacher qualification and achievement.

Table 49**Correlations between Teachers Experience and Performance in K.C.S.E in Agriculture
2009-2011: Mean Scores**

			K.C.S.E 2009-2011	Teaching experience
Spearman's rho	K.C.S.E mean score 2009-2011	Correlation	1.000	.160
		Coefficient		
		Sig. (2-tailed)	.	.424
		N	27	27
Teaching Experience		Correlation	.160	1.000
		Coefficient		
		Sig. (2-tailed)	.424	.
		N	27	31

Similarly, linear regression on teacher's characteristics such as age, qualification and teachers experience found that teachers' age and qualification did not influence performance in secondary school agriculture, because their t - values were all less than 1.96 while the significance was above 0.05 for all the independent variables considered (Table 51). However, the t-value for teaching experience was 3.172 (Table 51) which was greater than a critical t- value of 1.96, with a significance value of 0.04, which was less than 0.05 indicating that teachers teaching experience was a significant predictor of students' performance in agriculture in Rachuonyo North District. Thus the second hypothesis was rejected because the result on teachers teaching experience was statistically significant.

Table 50**Analysis of Variance (ANOVA) on Teacher Characteristics**

ANOVA ^b					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.737	3	5.246	3.614	.028(a)
Residual	33.385	23	1.452		
Total	49.122	26			

a. Predictors: (Constant), Age of the Teacher, Highest professional training of the respondent, Number of years of teaching agriculture

b. Dependent Variable: School Mean Score 2009-2011

Table 51**Regression Coefficients on Teacher Characteristics
Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	T	
1	(Constant)	5.421	1.136		4.770	.000
	Teachers Qualification	.023	.375	.011	.062	.951
	Teachers Experience	1.334	.421	.774	3.172	.004
	Age of the Teacher	-.424	.251	-.413	-1.692	.104

a. Dependent Variable: School Mean Score 2009-2011

4.7.3. Influence of student’s characteristics on academic performance of students’ in agriculture

H₀₃ Students’ characteristics have no statistically significant influence on students’ academic performance in agriculture.

There was a positive correlation between the age of the student and performance with an r value of .249 (Table 52). Thus one can say that the increase in age does cause an improvement in performance in secondary school agriculture.

With regard to student age, recent changes in educational policies around the world have led to an increase in the number of mature-age admissions in educational institutions. Trueman and Hartley (1996) in their study defined mature students as those students whose age was greater than 21 years on their first day at the university. Students who were 21 years of age and younger were classified as ‘young’ students. Mature students were thought to lack basic skills required for effective study or to be impaired by age-related intellectual deficits. Mature students tend to be admitted into their programmes with distinctly lower educational attainment than the young students (Newman-Ford, Lloyd & Thomas, 2009). However, when compared to the younger students, the academic performance of mature students is as good, if not better (Richardson, 1994).

Table 52

Correlation of Age of Students and Performance in 2012 Mock Agriculture Examination in Rachuonyo North District

		Age	Marks in Percentage
Age	Pearson Correlation	1	.073
	Sig. (2-tailed)	.	.249
	N	254	254
Marks in Percentage	Pearson Correlation	.073	1
	Sig. (2-tailed)	.249	.
	N	254	254

Table 53**Analysis of Variance on Students Age and Students Performance in 2012 Mock Agriculture Examination in Rachuonyo North District**

ANOVA^b

Model		Sum of Squares		Df		Mean Squares		F		Sig.	
1	Regression	284.189		1		284.189		1.335		.249(a)	
	Residual	53631.150		252		212.822					
	Total	53915.339		253							

a Predictors: (Constant), AGE

b Dependent Variable: Marks in Percentage

Linear regression results on age of the students found that the t-value was 1.156 which was less than 1.96, while the significance was 0.249 (Table 54) which was greater than 0.05. This therefore, means that students age was not a significant predictor of students' performance in agriculture in Rachuonyo North District.

Table 54**Regression Coefficients on Age and Students Performance in 2012 Mock Agriculture Examination in Rachuonyo North District**

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		T		Sig.	
		B	Std. Error	Beta					
1	(Constant)	32.763	13.129			2.496		.013	
	Age	.841	.728	.073		1.156		.249	

a Dependent Variable: Marks in Percentage

From the T-test analysis done to find out whether there is any significance difference in the mean performance between male and female respondents, it was found that the difference between the mean of males and females was not significant since the significance value was 0.732 (Table 55)

which is greater than 0.05. From the above analysis, it was concluded that Students' characteristics such as age, student career drives, gender, study habits and class attendance, did not have statistically significant influence on students' academic performance in agriculture and therefore, hypothesis three was accepted.

Table 55

Independent Samples T-Test Comparing the Means Score of Males and Female Students

		Levene's Test for		T-test for Equality of Means				
		Equality of						
		Variances						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.
% mark	Equal variances assumed	1.262	.262	-.343	252	.732	-.6512	1.89632
	Equal variances not assumed			-.351	210.987	.726	-.6512	1.85686

4.7.4. Influence of family characteristics on academic performance of students' in agriculture

H₀₄ Family characteristics have no statistically significant influence on students' academic performance in agriculture

When family size was correlated with performance of the students, there was a positive correlation of 0.56 meaning that the high the number of people the better the performance in agriculture (Table 56). This can be attributed to the fact that there could be a likelihood of many people in a household getting involved in agricultural activities to supplement their livelihood and therefore making such a student to have a positive attitude towards agriculture. This finding is contrary to the findings of Mathur and Hundal (1972) on the relationship between the size of family and academic achievement that revealed a negative correlation between size of the family

and academic achievement which indicated that, the bigger the family, the lower was the achievement. Similarly, the number of siblings was found to exert influence on the achievement of a student (Downey, 1995). As the number of children increases, parents can offer their children fewer resources. If other relevant background characteristics are taken into account, the number of children still has an effect on achievement, Downey (1995).

Table 56
Correlations between Performance and Family Size

		Family Size	Marks in Percentage
Family Size	Pearson Correlation	1	-.037
	Sig. (2-tailed)	.	.560
	N	253	253
Marks in Percentage	Pearson Correlation	-.037	1
	Sig. (2-tailed)	.560	.
	N	253	254

When correlation was done between level of education of the mother and students performance, it was found that there was a weak positive correlation with a correlation r value of .131. It thus seems that as the level of education of the mother increases, there is a slight increase in performance by the student (Table 57). This finding was consistent with the finding of Sharma (1984) whose study revealed that parental education was positively correlated with the academic achievement of their sons and daughters. However, Mathur and Hundal (1972) revealed a positive correlation between parent's educational level and academic achievement of the children. Krishnan (1977) conducted a study on 180 students from class 6 to 9 studying in central school, Tirupati, the results showed that parents' educational status had significant influence on the academic achievement of the children. In addition, a study by Bhatnagar and Sharma (1992), revealed that, the children whose parents attended school had higher academic performance than the children whose parents did not attend school. This indicated that parental education was related to the academic achievement of students. Similarly, Chakrabarti (1986) in a study that sampled 100 boys selected randomly from two English medium schools in Pune revealed that the

children whose parents were highly educated and involved in their study had better performance in both school examinations and achievement tests than those whose parents were rich but less educated and not involved in their children daily activities and studies.

Table 57

Correlations between Level of Education of the Mother and the Performance of the Students in 2012 Agriculture Mock Examination in Rachuonyo North District

		Marks in Percentage	Mother's Education
Marks in Percentage	Pearson Correlation	1	-.095
	Sig. (2-tailed)	.	.131
	N	254	254
Mother's Education	Pearson Correlation	-.095	1
	Sig. (2-tailed)	.131	.
	N	254	254

Table 58

Analysis of Variance (ANOVA) on Family Characteristics

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2429.955	5	485.991	2.341	.045(a)
	Residual	26778.978	129	207.589		
	Total	29208.933	134			

a. Predictors: (Constant), Respondent's family earnings per month, Number of people that live in the home, Level of education of Respondent's guardian, Level of education of Respondent's Father, Level of education of Respondent's mother

b. Dependent Variable: marks in Percentage

When multiple regression was done, it was found that the family characteristics did not have significant influence in performance in secondary school agriculture as none of the independent variables when regressed with a dependant variable (performance in agriculture) had a significance value less than 0.05 (Table 59), the only one that seems to be close to a significance of 0.05 was the family size, with a significance of 0.054 and a t-value of -1.941, meaning the larger the family size, the lower the performance of students in agriculture. All the t-values on family characteristics were all less than 1.96 and the significance were all greater than 0.05 (Table 59), meaning that family characteristics considered were not a significant predictor of students' performance in agriculture. Thus the fourth hypothesis was accepted that stated that Family characteristics (family income, family size and family level of education) have no statistically significant influence on students' academic performance in agriculture.

Table 59
Regression Coefficients on Family Characteristics

		Coefficients^a						
		Unstandardized		Standardized		95.0% Confidence		
		Coefficients		Coefficients		Interval for B		
		Std.				Lower	Upper	
Model		B	Error	Beta	T	Sig.	Bound	Bound
1	(Constant)	58.601	5.077		11.542	.000	48.555	68.647
	Family Size	-1.784	.919	-.166	-1.941	.054	-3.602	.034
	Guardian Education	1.579	1.006	.145	1.569	.119	-.412	3.570
	Father's Education	-3.396	1.869	-.239	-1.817	.072	-7.093	.302
	Mother's Education	.414	2.020	.027	.205	.838	-3.583	4.411
	Family's Income	-.829	.875	-.086	-.948	.345	-2.560	.902

a. Dependent Variable: marks in Percentage

4.8. Summary of the Results

In this study, use of theoretical methods of teaching does not necessarily mean that the teaching and learning resources are not needed. The resources can be available but students will continue performing poorly because those resources are never gainfully used, therefore, performance can continue being poor, but it is not the resources to blame, but other factors not investigated in this study. On teachers' characteristics, teachers experience was a significant predictor of students' performance in agriculture as more experienced teachers had higher mean scores in their subjects than the inexperienced teachers who had lower mean scores in their subjects and therefore, there should be a good balance between experienced and inexperienced teachers for better performance. Demonstration and field trips methods should be strengthened in schools to aid students learning. Guidance and counselling should be strengthened in schools to help students choose optional subjects that match their career ambitions as it was found that students who had a natural liking for agriculture performed better compared to other students. Monitoring of class attendance should be a priority in schools as it was revealed that students that do not miss classes perform better than those that miss classes. In addition, timetabling in schools should be made in such a way to allow for private students learning during class time and preps time as this was found to increase students' performance in agriculture. Large family size was found to lower performance of students, and therefore the government should strengthen family planning campaigns to enable more families have small family size for better performance of students in schools. Hypotheses on teaching and learning resources, students characteristics and family characteristics' did not yield significant influence on students' performance because, there could be other factors that may have been antecedents to the factors studied, in Rachuonyo North District.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter presents a summary of the study and draws conclusions from the findings of the study, implications and recommendations based on the conclusions.

5.2. Summary of the Study

The purpose of this study was to determine the influence of selected factors on academic performance of students in secondary school agriculture in schools in Rachuonyo North District that were responsible for the low academic performance of students, in order to offer recommendations for improvement and good academic results which will provide more career choices and job security. In order to address the purpose, the following objectives were addressed:

- i. To determine the influence of availability of teaching and learning resources on the students' academic performance in agriculture in Rachuonyo North District.
- ii. To determine the influence of teachers' characteristics on the students' academic performance in agriculture in Rachuonyo North District.
- iii. To determine the influence of students' characteristics on the students' academic performance in agriculture in Rachuonyo North District.
- iv. To determine the influence of family characteristics on the students' academic performance in agriculture in Rachuonyo North District.

The study adopted a co-relational design. Stratified random sampling was used to select schools for the study. The target population included 30 agriculture teachers and 9059 students. The sample size was 254 Form Four agriculture students. Data collection was done using two sets of questionnaires, namely for students and agriculture teachers, as respondents. Data was analyzed using qualitative and quantitative methods where descriptive statistics including frequencies, percentages as well as means were used, while inferential statistics which included t-test, correlation coefficient, as well as, simple and multiple regression analysis were used to test the hypotheses, with levels of significance set at 0.05. Statistical Package for Social Sciences (SPSS) version 11 computer software was used for data analysis.

The following were the summary of the findings:

i) Whether availability of teaching and learning resources influenced performance in secondary school agriculture: The results revealed that majority of the schools had laboratories, classrooms, school farms, libraries and adequate text books for agriculture, however, the study found that many schools did not have farm structures. In addition, the study found that schools without laboratories, school farms and farm structures had a higher mean score as compared to schools having these facilities. However, schools with classrooms, textbooks and libraries had higher mean scores as compared to schools without these facilities. However, a linear regression found that the number of teaching resources available did not have a significant influence in performance in agriculture in Rachuonyo North District. Similarly, analysis of variance found a significance value of more than 0.05, indicating that the regression analysis was not statistically significant and therefore, the availability of teaching and learning resources considered did not play an important role in explaining the variation in the dependent variable (performance in agriculture). This was also supported by the t-values of the independent variable being less than 1.96, meaning that performance in secondary school agriculture was not significantly influenced by the availability of teaching and learning resources in Rachuonyo North District. Thus the first hypothesis was therefore, accepted.

ii) The influence of teachers' characteristics on the students' academic performance in agriculture in Rachuonyo North District: The study found that a majority of the agriculture teachers were male compared to their female counterparts. The study also revealed that most teachers were below the age of 29 years old. On teachers' qualification, the study found that most teachers were trained to teach agriculture; however, students taught by teachers who had master's degree had a higher mean score compared to other qualifications. Concerning teachers' experience, majority of the respondent teachers had less than five years' teaching experience; however, the study revealed that more experienced teachers had higher mean scores in their subjects than the inexperienced teachers. Most teachers preferred demonstration and field trip methods of teaching. Majority of the respondents' teachers expressed a positive attitude towards teaching agriculture. In addition, linear regression results on teachers' characteristics (Age, Qualification, teaching method and attitude towards teaching) and performance in secondary school agriculture found that the influence was not significant as the t - values were all less than

1.96 while the significance was above 0.05. However, the t-value for teaching experience was 3.172 (Table 51) which was greater than a critical t- value of 1.96, with a significance value of 0.04, which was less than 0.05 indicating that teachers experience was a significant predictor of students' performance in agriculture in Rachuonyo North District. Thus the second hypothesis was rejected because the result on teachers teaching experience was statistically significant.

iii) The influence of students' characteristics on their academic performance in agriculture: While determining students' age, the study found that most of the students' respondents were 18 years old. The study also found that majority of the students would wish to pursue agriculture related careers. Furthermore, the study found that the students who preferred a future career in agriculture related disciplines had a higher mean score as compared to other career choices. The study also found that there were more male students than female students; however, the study revealed that female students slightly performed better as compared to performance of male students. The study revealed that students who preferred to study during class time and preps time had the highest mean score as compared to students who chose other options. On class attendance, the study revealed that students who did not miss classes had a higher mean score as compared to those who sometimes missed classes. Furthermore, a positive correlation was found between the age of the students and performance, while, results of a linear regression exhibited no significant relationship on age and students' performance. It was therefore, concluded that students' characteristics did not have statistically significant influence on students' academic performance in agriculture and therefore, hypothesis three was accepted.

iv) The influence of family characteristics on the students' academic performance in agriculture: The study found that majority of the students came from families that earned below two thousand shillings per month and these students had higher mean score compared to students coming from families with the highest monthly income. The study also found that majority of the respondents students came from families having five to eight dependants. The study established that students coming from smaller family sizes had a higher mean score compared to students coming from larger family size. In addition, the study found that students whose fathers and mothers had no formal education had a higher mean score compared to students whose parents had university education, while students whose guardians had college education had higher mean score compared to students whose guardians had primary education. Similarly, a positive

correlation was found between family size and students' performance. The study revealed that most of the respondents' fathers had attained secondary education, while the study found that almost half of the respondents' mothers had primary education and non-formal education. Similarly, the study found a positive correlation between level of education of the mother and students' performance. Furthermore, multiple regression results on family characteristics found no significant influence of family characteristics on students' performance in secondary school agriculture in Rachuonyo North District, thus the fourth hypothesis was accepted.

5.3 Conclusions

From this study, the following conclusions can be drawn.

- i) According to the data collected, it was concluded that there was no significant influence between teaching and learning resources and academic performance in secondary school agriculture.
- ii) Demonstration and field trips methods came out strongly over other methods as the most appropriate method of teaching agriculture. However, the study concluded that teachers experience was a significant predictor of students' performance in agriculture in Rachuonyo North District, because, the result on teachers teaching experience was statistically significant.
- iii) The study observed that students' career drives, gender, study habits and class attendance positively influence students' performance in secondary school agriculture. However, tests for statistical significance concluded that students' characteristics did not have significant influence on students' academic performance in agriculture.
- iv) The study observed that parental low levels of education positively influenced students' performance. However, it was concluded that family characteristics had no influence on students' academic performance in agriculture.

5.4 Recommendations

In order to address the problem of low performance of students in secondary school agriculture in Rachuonyo North District based on the study's conclusions, and more so on literature reviewed and concluding remarks on the findings, the following recommendations are made.

5.4.1 Recommendations from the Study

- i. Teaching and learning resources considered (laboratories, classrooms, school farms, farm structures, text books and libraries should be used gainfully by the students and teachers to enable students excel in their studies.
- ii. For optional courses such as agriculture, schools should have strong inbuilt career guidance so that students choose those optional subjects that match their career objectives. This is evident from the findings that students who have a natural liking for agriculture performed better than those who did not.
- iii. Teaching by demonstration and field trips methods should be strengthened in the teaching of agriculture in schools. Noting that there was a positive correlation between demonstration and field trips methods and performance in agriculture.
- iv. The Government of Kenya should post more experienced teachers of agriculture in Rachuonyo North District to supplement the younger teachers present in order to aid student learning.
- v. The school management should ensure that students attend lessons regularly and they should mitigate factors that lead to absenteeism of students from classes.

5.4.2 Recommendation for Further Research

Further research is needed to explore the problem on a large sample from a larger geographical region including other factors such as class size, resource use by teachers, teacher-pupil relationships, and teachers teaching style, motivation and reflectivity. Students' motivation, peer influence, communication ability and learning style as well as, family relationships, attitudes towards values and expectations and poverty should be studied to determine their influence on students' performance in secondary school agriculture. These factors may have been antecedents to the factors studied, since the three objectives do not seem to be the real cause of poor performance in Rachuonyo North District.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FOR FORM FOUR STUDENTS

The purpose of this questionnaire is to attempt to understand factors influencing academic performance of students in secondary school agriculture. All the information you provide will be confidential.

INSTRUCTIONS

Please do not write your name in this questionnaire

Indicate your choice by a tick (√) or provide the information required in the spaces provided.

Kindly answer all the questions

SECTION A

- 1. Your gender Male [] Female []
- 2. Your age -----

SECTION B

3. What is your rating of the availability of the following agricultural teaching and learning resources in your school? Give your response by ticking (√)

Resource / Facilities	Readily available	Available	Not available
a). Laboratory	[]	[]	[]
b). School farm	[]	[]	[]
c). Farm structures	[]	[]	[]
d). Textbooks	[]	[]	[]
e). Library	[]	[]	[]

5. Do you normally use the following agricultural teaching and learning resources in your school? Give your response by ticking (√)

Resource / Facilities	Frequently	Sometimes	Never
a). Laboratory	[]	[]	[]
b). School farm	[]	[]	[]
c). Farm structures	[]	[]	[]

- d). Textbooks [] [] []
- e). Library [] [] []

6. How do you rate your school in relation to adequacy of agriculture books and reference materials?

- a). Well-equipped []
- b). Moderately equipped []
- c). Poorly equipped []

7. How would you rate your school in the district (i.e. in terms of its teachers', classrooms, equipment compared to other schools?

- a). Very Good []
- b). Good []
- c). Average []
- d). Poor []
- e). Very Poor []

8. Does your school have adequate classrooms for teaching and learning purposes?

- a) Yes []
- b) No []

9. Which teaching method is normally used by your agriculture teacher? You can select more than one option.

- a). Lecture method []
- b). Project method []
- c). Discussion method []
- d). Field trips method []
- e). Demonstration method []
- f). Others (specify) _____

10. What type of career would you like to pursue in future?

- a). Agriculture related career []
- b). Engineering related career []
- c). Medical related career []
- d). Business related career []
- e). Teaching related career []
- f). Others (specify) _____

11. What was your score (marks obtained) in Rachuonyo North District mock agriculture examination of 2012? _____

12. Concerning your study habits, do you like studying at the following times? You can choose more than one option

- a). Class time []
- b). Preps time []
- c). Dawn time []
- d). At home []
- e). During holidays []
- f). Others (Specify) _____

13. Do you always engage in group discussions while studying agriculture with other students?

- a). Yes []
- b). No []
- c). Sometimes []

14. Have you ever missed agriculture classes in your school?

- a). Yes []
- b). No []
- c). Sometimes []

15. How much do you estimate your family makes per month? In Kenya Shillings

- | | | | |
|------------------|-----|------------------|-----|
| a). 00- 2000 | [] | e). 15001- 20000 | [] |
| b). 2001- 5000 | [] | f). 20001-50000 | [] |
| c). 5001- 10000 | [] | g). Over 50001 | [] |
| d). 10001- 15000 | [] | | |

16. What is the level of education of your mother?

- | | | | |
|-------------------------|-----|----------------|-----|
| a). No formal Education | [] | d). College | [] |
| b). Primary Education | [] | e). University | [] |
| c). Secondary Education | [] | | |

17. What is the level of education of your father?

- | | | | |
|-------------------------|-----|----------------|-----|
| a). No formal Education | [] | d). College | [] |
| b). Primary Education | [] | e). University | [] |
| c). Secondary Education | [] | | |

18. In case you are not taken care of by your parents, what is the level of education of your guardian?

- | | | | |
|------------------------|-----|----------------|-----|
| a).No formal Education | [] | d). College | [] |
| b). Primary Education | [] | e). University | [] |
| c).Secondary Education | [] | | |

19. How many people live at your home? _____

THANK YOU

APPENDIX B

QUESTIONNAIRE FOR AGRICULTURE TEACHERS

The purpose of this questionnaire is to attempt to understand factors influencing academic performance of students in secondary school agriculture. All the information you provide will be confidential.

INSTRUCTIONS

- i. Please do not write your name in this questionnaire
- ii. Indicate your choice by a tick (✓) or provide the information required in the spaces provided.
- iii. Kindly answer all the questions.

SECTION A

Please respond by filling in the blank spaces provided or by ticking (✓)

1. Your age _____
 2. Your gender Male [] Female []
 3. For how long have you taught in this school as agriculture teacher?
 - a). Less than 5 years []
 - b). 5 – 10 years []
 - c). 11 – 15 years []
 - d). 16 – 20 years []
 - e). Others (specify). _____
 4. What is your highest educational level?
 - a) KCSE []
 - b) KCE []
 5. What is your highest professional training?
 - a) Certificate in Agriculture []
 - b) Diploma in Agricultural Education []
 - c) B.Sc Agriculture []
 - d) B.Sc Agricultural Education []
 - e) M.Sc Agricultural Education/Extension []
 - f) Others (Specify) _____
-

SECTION B

6. What is your rating of the availability of the following agricultural teaching and learning resources in your school? Give your response by ticking (✓)

Resource / Facilities	Readily available	Available	Not available
a). Agriculture Textbooks	[]	[]	[]
b).Classrooms	[]	[]	[]
c).Farm structures	[]	[]	[]
d).School farm	[]	[]	[]

7. Do you normally use the following agricultural teaching and learning resources in your school? Give your response by ticking (✓)

Resource / Facilities	Frequently	Sometimes	Never
a). Textbooks	[]	[]	[]
b).Classrooms	[]	[]	[]
c).Farm structures	[]	[]	[]
d).School farm	[]	[]	[]
e).Laboratory	[]	[]	[]
f).Library	[]	[]	[]

8. What is your preferred method of teaching agriculture? You can select more than one option.

- | | | | |
|-------------------------|-----|----------------------------|-----|
| a). Lecture method | [] | d) Field trips method | [] |
| b). Project method | [] | e) Discussion method | [] |
| c).Demonstration method | [] | f). Others (specify) _____ | |

9. In your opinion, indicate by ticking your attitude towards teaching agriculture in your school?

- | | | | |
|-----------------------|-----|-----------------------|-----|
| a). Positive attitude | [] | b). Negative attitude | [] |
|-----------------------|-----|-----------------------|-----|

10. Please indicate your feeling about teaching agriculture by ticking appropriate column i.e. Strongly Agree (SA), Agree (A), Not Sure (NS), Disagree (D) and Strongly Disagree (SD)

	SA	A	NS	D	SD
Teaching agriculture is interesting					
Teaching agriculture is an interesting career					
I am satisfied with teaching agriculture?					
Teaching develops teachers reasoning ability					
Teaching agriculture encourages the students to engage in agricultural activities at home					
Teaching agriculture is beneficial to the school					

11. Do your students attend agriculture lessons regularly?

a) Yes [] b). No [] c).Sometimes []

12. How do you rate your school in relation to adequacy of books and reference materials?

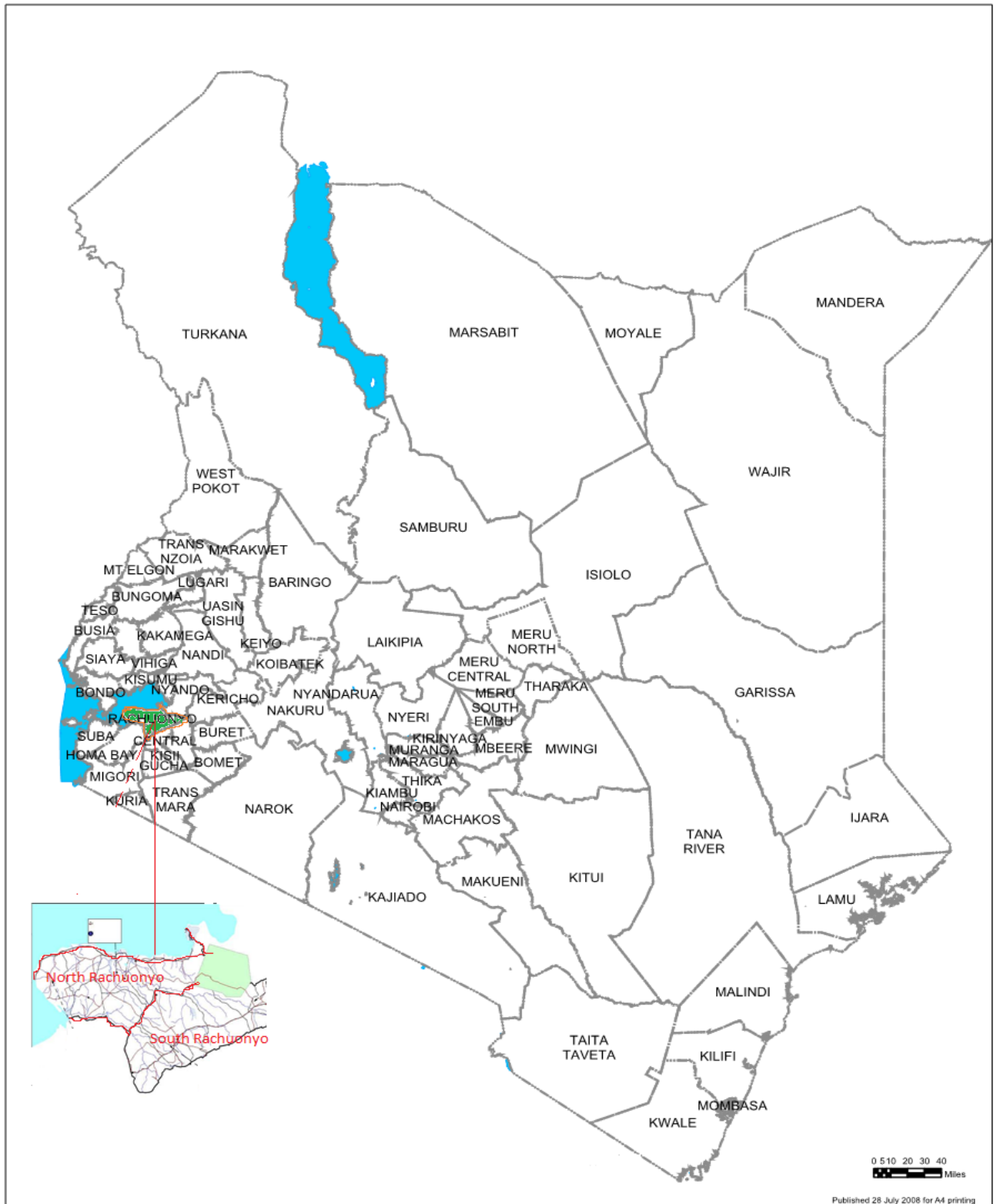
a). Well-equipped [] b).Moderately equipped [] c). Poorly equipped []

13. Indicate the mean score of the school in agriculture in KCSE from 2009-2011

Year	Mean score
2009	_____
2010	_____
2011	_____

THANK YOU.

APPENDIX C: MAP OF THE STUDY AREA



Source: Political Map of Kenya (2012)

APPENDIX D: RESEARCH PERMIT

PAGE 2 PAGE 3


Research Permit No. NCST/RCD/14/012/1486

THIS IS TO CERTIFY THAT: **Date of issue** **26th October, 2012**
Prof./Dr./Mr./Mrs./Miss/Institution **Fee received** **KSH. 1,000**

Peter Oyier Ogweno
of (Address) Egerton University
P.O.Box 536, Egerton.
has been permitted to conduct research in

Location

Rachuonyo North District
Nyanza Province


Applicant's Signature

on the topic: Influence of selected factors on academic performance of students on secondary school agriculture in Rachuonyo North District, Kenya.

Secretary
National Council for Science & Technology

for a period ending: 31st December, 2012.

APPENDIX E: LETTER OF RESEARCH AUTHORIZATION

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349
254-020-310571, 2213123, 2219420
Fax: 254-020-318245, 318249
when replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref:

NCST/RCD/14/012/1486

Date:

26th October 2012

Peter Oyier Ogweno
Egerton University
P.O.Box 536,
Egerton.

RE: RESEARCH AUTHORIZATION

Following your application for authority dated *18th October, 2012* to carry out research on *"Influence of selected factors on academic performance of students on secondary school Agriculture in Rachuonyo North District, Kenya,"* I am pleased to inform you that you have been authorized to undertake research in **Rachuonyo North District** for a period ending **31st December, 2012**.

You are advised to report to **the District Commissioner and the District Education Officer, Rachuonyo North District** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR M.K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioner
The District Education Officer
Rachuonyo North District.

"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development".

APPENDIX F: LETTER OF RESEARCH AUTHORIZATION



OFFICE OF THE PRESIDENT PROVINCIAL ADMINISTRATION & INTERNAL SECURITY

Telegram:
Telephone:

District Commissioner,
Rachuonyo North District,
P.O. Box 27

When replying, please quote:

Email: dcrachuonyonorth@yahoo.com.

Ref No: RAN/ADM/2/14/VOL.1/28

KENDU BAY.

Date: 19th November, 2012

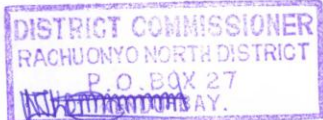
Peter Oyier Ogweno
Egerton University
P.O BOX 536,
EGERTON

RE: RESEARCH AUTHORIZATION.

Your application for authority to carry out research on "*Influence of selected factors on academic performance of students on secondary school Agriculture in Rachuonyo North District, Kenya;*" has been considered.

I am, therefore, pleased to inform you that you have been authorized to carry out the said research in the District with effect from **19th November 2012** to **31st December 2012.**

In case you encounter any challenges during your research, don't hesitate to contact this office at your earliest convenience. This office will also appreciate if you would share your findings with us on completion of your research.



(NANCY J KIPTOO),
FOR: DISTRICT COMMISSIONER,
RACHUONYO NORTH DISTRICT.

APPENDIX G: LETTER OF RESEARCH AUTHORIZATION

Email: deorachuonyonorth@gmail.com
Telephone: 0208080584



DISTRICT EDUCATION OFFICE,
RACHUONYO NORTH,
P.O. BOX 185 – 40301,
KENDU BAY.

When replying please quote
REF: RND/ADM/GEN/VOLI/19

19TH November, 2012.

Peter Oyier Ogwen
Egerton University
P.O Box 536,
Egerton.

RE: RESEARCH AUTHORIZATION

Following your application for authority dated 26th October, 2012 to carry out research on “**Influence of selected factors on academic performance of students on Secondary school Agriculture in Rachuonyo North District, Kenya,**” has been considered.

I’m, therefore, pleased to inform that you have been authorized to carry out the said research in the District.

f. DISTRICT EDUCATION OFFICER
RACHUONYO NORTH
P. O. Box 185 - 40301
KENDU-BAY

OBUNDE F. O
For; DISTRICT EDUCATION OFFICER,
RACHUONYO NORTH.